AD-A067 843 AIR FORCE GEOPHYSICS LAB HANSCOM AFB MASS F/G 4/1
MODELING OF THE GEOSYNCHRONOUS ORBIT PLASMA ENVIRONMENT. PART 3--ETC(U)
JAN 79 H B GARRETT, R E MCINERNEY

UNCLASSIFIED AFGL-TR-79-0015 NL

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LEVEL II

AFGL-TR-79-0015

Modeling of the Geosynchronous Orbit Plasma Environment—Part 3. ATS-5 and ATS-6 Pictorial Data Atlas

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16 January 1979

A067 018
pt.1 AD53 164

Unclassified

SECURITY CLASSIFICATION OF THIS PAGE (When Data Entered)

REPORT DOCUMENTATION PAGE

READ INSTRUCTIONS BEFORE COMPLETING FORM

(14) 1. REPORT NUMBER: AFGL-TR-79-0015 > AFGL-ERP-653

2. GOVT ACCESSION NO.

3. RECIPIENT'S CATALOG NUMBER

(6) 4. TITLE (and Subtitle): MODELING OF THE GEOSYNCHRONOUS ORBIT PLASMA ENVIRONMENT. PART 3. ATS-5 AND ATS-6 PICTORIAL DATA ATLAS.

5. TYPE OF REPORT & PERIOD COVERED: Scientific. Interim.

6. PERFORMING ORG. REPORT NUMBER: ERP No. 653

(10) 7. AUTHOR(s): Henry B. Garrett, ~~Capt, USAF~~
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B. Johnson
S. E. DeForest

8. CONTRACT OR GRANT NUMBER(s)

9. PERFORMING ORGANIZATION NAME AND ADDRESS: Air Force Geophysics Laboratory (PHG), Hanscom AFB, Massachusetts 01731

10. PROGRAM ELEMENT, PROJECT, TASK AREA & WORK UNIT NUMBERS: (16) 62101F 76610803 (17) 08

11. CONTROLLING OFFICE NAME AND ADDRESS: Air Force Geophysics Laboratory (PHG), Hanscom AFB, Massachusetts 01731

(11) 12. REPORT DATE: 15 January 1979

13. NUMBER OF PAGES: 268

14. MONITORING AGENCY NAME & ADDRESS(if different from Controlling Office): (9) Interim rept.

15. SECURITY CLASS. (of this report): Unclassified

15a. DECLASSIFICATION/DOWNGRADING SCHEDULE

16. DISTRIBUTION STATEMENT (of this Report)

Approved for public release; distribution unlimited.

17. DISTRIBUTION STATEMENT (of the abstract entered in Block 20, if different from Report)

(12) 266 p.

18. SUPPLEMENTARY NOTES

19. KEY WORDS (Continue on reverse side if necessary and identify by block number)

Geosynchronous environment
Space charging
Plasma environment

20. ABSTRACT (Continue on reverse side if necessary and identify by block number)

Data on the geosynchronous plasma environment derived from the UCSD plasma detectors on the ATS-5 and ATS-6 satellites have been carefully compiled into a pictorial atlas. The atlas consists of 12 days of data from 1969 (ATS-5), 38 days from 1970 (ATS-5), 37 days from 1974 (ATS-6), and 8 days from 1976 (ATS-6). The data are 10-min averages of the first four moments of the plasma distribution function for the electrons and ions. The data are presented in the form of spectrograms and line plots along with detailed ephemeris and geophysical information. Two computer tapes are available, the

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formats of which are given in an appendix.

Preface

The work accomplished by the University of California at San Diego was performed under AF Contract F19628-77-C-0014. Many people contributed to this study. In particular, programming at AFGL was provided by A. Lacroix and E. Ziemba (originally of ASEC). At UCSD, C. McPhadden was responsible for providing tapes and spectrograms. Valuable assistance was also rendered by the AFGL photographic laboratory. C. Pike was, undoubtedly, the prime moving force behind this document and it is to him we dedicate the results. E. Robinson (AFGL/SUA) kindly provided the orbital data.

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Modeling of the Geosynchronous Orbit Plasma Environment – Part 3. ATS-5 and ATS-6 Pictorial Data Atlas

1. INTRODUCTION

A basic difficulty in studying the low-energy geosynchronous environment has been the lack of readily available date (see review by Garrett[1]). The University of California at San Diego (USCD) has been a chief source of such data owing to the unique plasma experiments they flew on the ATS-5 and ATS-6 geosynchronous satellites. This report seeks to provide random selections of that data that have been carefully reviewed and, as far as possible, put in a form readily accessible to the scientific and engineering community interested in studying the geosynchronous environment.

The report is arranged in four sections. The first section will deal with the general characteristics of the ATS-5 and ATS-6 detectors. Subsequent sections will in turn deal with the conversion of the data into the four moments and other useful quantities, assumptions made in preparing the data, and finally with the availability and use of the data. The text is supplemented with four appendices that consist of the daily spectrograms and line plots of the four moments, the orbital elements, geophysical parameters, and the tape formats for the two ATS-5 and ATS-6 data tapes.

(Received for publication 12 January 1979)

1. Garrett, H. B. (1979) Review of quantitative models of the 0 to 100 keV near-earth plasma. To appear in Rev. of Geophys.

2. INSTRUMENTS

Two satellites served as data sources for the study. These were the ATS-5 and ATS-6 geosynchronous satellites. Although we shall briefly describe each of these satellites, the reader is referred to DeForest and McIlwain[2] for details of the ATS-5 instrument, and Mauk and McIlwain[3] for details of the ATS-6 instrument.

The ATS-5 and ATS-6 satellites are in low inclination, geosynchronous orbits. The ATS-5 satellite is cylindrical (1.8 m long by 1.5 m in diameter). It spins at 1.27 rps with its axis parallel to the earth's rotation axis. The ATS-6, in contrast, is essentially a large (10 m) spin-stabilized dish antenna. The plasma data were obtained from the University of California at San Diego (UCSD) plasma experiments on ATS-5 and ATS-6. Both instruments consist of electrostatic analyzers designed to measure the positive ion and electron populations between 51 eV and 51 keV for ATS-5 and between 0 and 80 keV for ATS-6.

The ATS-5 and ATS-6 instruments measure the particle flux in 64 channels (2 background channels and 62 energy channels), returning a complete energy spectrum in 20 and 15 sec, respectively. For ATS-5, the center energy for a channel is 112 percent of the center energy of the previous channel. For ATS-6 this value is ~113 percent. This results in an uncertainty of about ± 5 percent in the energy (or potential) determination.

The ATS-5 and ATS-6 instruments return count rate data which are converted to differential energy spectra. From the differential energy spectra, the ambient currents and distribution functions necessary in estimating the ambient environment are determined. The satellite spectra also indicate the spacecraft potential. Briefly, the low energy ion (electron) population is accelerated if the satellite has a negative (positive) potential relative to the ambient plasma. This acceleration produces a pronounced peak in the low energy ion (electron) channels at an energy in electron volts (eV) corresponding to the satellite potential in volts (V) (see Figure 1). Thus, ATS-5 and ATS-6 provide information on both the ambient plasma and the spacecraft potential. Table 1 lists the days for which continuous data were available. In actuality, there was approximately 80 percent data coverage for these days.

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2. DeForest, S. E., and McIlwain, C. E. (1971) Plasma clouds in the magnetosphere, J. Geophys. Res. 76(No. 16):3587-3611.

3. Mauk, B. H., and McIlwain, C. E. (1975) ATS-6 UCSD auroral particles experiment, IEEE Trans. Aerospace and Electronic Systems, AEA-11(No. 6):1125-1130.

Table 1. Days Used in AFGL Statistical Analysis

ATS-5 (Year/Day)				
1969/312	1969/326	1970/37	1970/109	1970/319
313	327	38	110	320
318	1970/25	39	111	321
319	26	40	112	322
320	27	41	113	323
321	28	42	114	324
322	29	43	271	325
323	30	44	272	326
324	31	107	273	327
325	32	108	274	328
ATS-6 (Year/Day)				
1974/186	1974/196	1974/266	1974/299	1976/44
187	197	267	300	45
188	198	268	301	46
189	199	269	302	47
190	200	270	303	48
191	201	271	304	
192	202	272	305	
193	203	274	1976/41	
194	204	296	42	
195	205	297	43	

3. MOMENT CALCULATIONS

The ATS-5 and ATS-6 return count rates in selected energy channels. These count rates, for electrostatic analyzers, are converted directly to the differential energy flux by multiplication by a fixed constant (this constant varies slightly at the lower energies for ATS-6). The differential energy flux is then converted to the distribution function for the plasma—that is, the function (usually referred to as f) which when integrated over all velocity directions and positions in a volume gives the total number of particles in the volume. As will be outlined in this section, the distribution functions were employed to estimate 10-min values of the first four plasma moments. It is these values that are presented in the study.

A commonly encountered distribution function is the so-called Maxwellian distribution for an isotropic plasma

$$f(v_i) = n_i\left(\frac{m_i}{2\pi kT_i}\right)^{3/2} e^{-m_i v^2{}_i/2kT_i} \qquad (1)$$

where

n_i = number density of species i,

m_i = mass of species i,

T_i = temperature of species i,

v_i = velocity of i species,

k = Boltzmann constant,

f = distribution function in sec^3/km^6.

Although most plasma distributions in space are neither Maxwellian nor isotropic, these assumptions are commonly made in characterizing a plasma in order to reduce the number of parameters necessary for description. Further, Eq. (1) can be used in the calculation of the first four plasma moments that will generate the model. For a Maxwellian particle distribution, they are

$$\langle n_i \rangle = 4\pi \int_0^\infty (v_i^0)\, f_i\, v_i^2\, dv_i = n_i , \tag{2}$$

$$\langle NF_i \rangle = \int_0^\infty (v_i^1)\, f_i\, v_i^2\, dv_i = \frac{n_i}{2\pi} \left(\frac{2\,kT_i}{\pi\, m_i} \right)^{1/2} , \tag{3}$$

$$\langle E_i \rangle = 4\pi \int_0^\infty \frac{1}{2} m_i (v_i^2)\, f_i\, v_i^2\, dv_i = \frac{3}{2} n_i\, k\, T_i , \tag{4}$$

$$\langle EF_i \rangle = \int_0^\infty \frac{1}{2} m_i (v_i^3)\, f_i\, v_i^2\, dv_i = \frac{m_i\, n_i}{2} \left(\frac{2\,kT_i}{\pi\, m_i} \right)^{3/2} \tag{5}$$

where

$\langle n_i \rangle$ = number density for species i (number/cm^3),

$\langle NF_i \rangle$ = number flux for species i (number/cm^2-sec-sr),

$\langle E_i \rangle$ = energy density for species i (eV/cm^3),

$\langle EF_i \rangle$ = energy flux for species i (eV/cm^2-sec-sr).

The use of moments is similar to expanding a function in a Taylor series. The moments are, in statistical terms, the expectation values of a variable (that is, the average value, the standard deviation, and so on). For a plasma, the moments of the velocity are taken as follows: $\langle v^0 \rangle$, $\langle v^1 \rangle$, $\langle v^2 \rangle$, and $\langle v^3 \rangle$. In Eqs. (2) to (5),

these moments have been multiplied by constants to give physically meaningful quantities. For example, the $\langle v^2 \rangle$ moment has been multiplied by 4π and $1/2\, m_i$ to give the isotropic energy density $4\pi \langle 1/2\, m_i\, v^2 \rangle$.

As previously discussed, the count rates are directly proportional to the differential energy flux $\frac{d\langle EF \rangle}{dE}$ (where E is energy). The differential energy flux is converted to the distribution function by the simple relation

$$f_i(E) = \frac{d\langle EF_i \rangle}{dE} \frac{\frac{1}{2} m_i^2}{E^2} \tag{6}$$

where

$$E = 1/2\, m_i\, v^2 .$$

The distribution function thus determined is, however, the distribution function at the detector and hence is not representative of the true ambient environment. In Section 4 we will cover the corrections necessary. Here we merely note that they are carried out and the moments calculated for 10-min intervals employing Eqs. (2) to (6). Applications of these moments will be discussed in the following.

The four moments of the distribution function are of value in their own right. Assuming, for example, an isotropic flux, the number flux is equal to the current striking the spacecraft (if $\langle NF_i \rangle$ is multiplied by $\pi q = 5 \times 10^{-10}$, where q is the charge, the results are in n A/cm^2). Several other quantities can, however, also be derived—namely the distribution function of Eq. (1). As we know the density from Eq. (2) we only need derive the temperature T. According to Eqs. (2) to (5), T is given by

$$T(AVG) = \frac{2}{3} \frac{\langle E_i \rangle}{\langle n_i \rangle}, \tag{7}$$

or by

$$T(RMS) = \frac{\langle EF_i \rangle}{2\, \langle NF_i \rangle}. \tag{8}$$

If the plasma is Maxwellian (and isotropic) then T(AVG) = T(RMS). Unfortunately, in general T(AVG) ≠ T(RMS) (see Garrett et al[4]) at geosynchronous orbit. Observation reveals that in reality the distribution function is much more complex and can better be represented by sums of two or more Maxwellian components.

4. Garrett, H. B., Mullen, E. G., Ziemba, E., and DeForest, S. E. (1978) Modeling of the Geosynchronous Orbit Plasma Environment—Part 2. ATS-5 and ATS-6 Statistical Atlas, AFGL-TR-78-0304.

From the four moments of the distribution function, it is possible to derive a two-Maxwellian fit to the plasma distribution. That is, if f_2 is given by:

$$f_2(v_i) = \left(\frac{m_i}{2\pi k}\right)^{3/2} \left[\frac{N1_i}{T1_i^{3/2}} e^{-\frac{m_i v_i^2}{2kT1_i}} + \frac{N2_i}{T2_i^{3/2}} e^{-\frac{m_i v_i^2}{2kT2_i}} \right] . \tag{9}$$

the expressions for $N1_i$, $T1_i$, $N2_i$, and $T2_i$ are easily derived from the 4 moments. Inserting Eq. (9) into Eqs. (2) to (5), we get

$$N1_i + N2_i = \langle n_i \rangle = C_1 , \tag{10}$$

$$N1_i\, T1_i^{1/2} + N2_i\, T2_i^{1/2} = \langle NF_i \rangle \left(\frac{\pi m_i}{2k}\right)^{1/2} 2\pi = C_2 , \tag{11}$$

$$N1_i\, T1_i + N2_i\, T2_i = \frac{2}{3} \frac{\langle E_i \rangle}{k} = C_3 , \tag{12}$$

$$N1_i\, T1_i^{3/2} + N2_i\, T2_i^{3/2} = \langle EF_i \rangle \left(\frac{\pi m_i}{2k}\right)^{3/2} \frac{2}{m_i} = C_4 . \tag{13}$$

These four equations can be reduced to a quadratic expression in terms of $T1_i^{1/2}$ If we define three new variables

$$A = C_2^2 - C_1 C_3 , \tag{14}$$

$$B = C_1 C_4 - C_2 C_3 , \tag{15}$$

$$C = C_3^2 - C_2 C_4 , \tag{16}$$

then it can be shown that

$$T1_i^{1/2} = \frac{-B + \sqrt{B^2 - 4AC}}{2A} \tag{17}$$

$$T2_i^{1/2} = \frac{-B - \sqrt{B^2 - 4AC}}{2A} \tag{18}$$

$$N2_i = \frac{C_2 - T1_i^{1/2} C_1}{T2_i^{1/2} - T1_i^{1/2}} , \tag{19}$$

$$N1_i = \langle n_i \rangle - N2_i . \tag{20}$$

It is simple to prove the uniqueness of this solution and, in general, no ambiguities exist. Occasionally (for example if the distribution function is actually a single Maxwellian) $T1_i^{1/2}$, $T2_i^{1/2}$, $N1_i$, or $N2_i$ may be negative or imaginary. Thus a certain amount of care must be exercised in computing these parameters.

4. PROBLEM AREAS

In Figure 1 we present a spectrogram for Day 178 of 1974. The spectrogram is a 3-dimensional plot developed by UCSD (see DeForest and McIlwain[2]), in which the X-axis is time, the Y-axis is energy, and the third dimension, represented by shading, is the detector count rate (remember this is directly proportional to the differential energy flux). Day 178 happens to be one of the most exceptional days recorded by ATS-6 (it is not, however, included in our study) as the potential between the spacecraft and the ambient environment reached nearly -2000 V while the satellite was in sunlight at ~0415 UT. We have included it here to illustrate some of the problems encountered in interpreting the ATS-5 and ATS-6 data.

The first significant feature to be observed is the absence of data at varying energies below about 10 eV for the electrons and ions (particularly between 0300 UT and 0200 UT and between 1700 UT and 2400 UT—this is not the same as loss of data between 0930 UT and 1100 UT). This is due to a temperature problem affecting the lower energy channels on ATS-6 (note: ATS-5 did not have this problem). Although it is normally possible to accurately correct for this effect, the ion data for 1976 covered in this report are affected as reflected in the sudden increase in the density—in one case rising to $320/cm^3$—in conjunction with the temperature change. Thus, any data where a significant change in temperature is observed in the spectrogram (as evidenced by a change in the low energy cut-off), should be considered very carefully. The effect is primarily in the interpretation of the energy of the low energy ions. As the low-energy component is given less and less weight in the moment integrals as we go to higher moments, this effect becomes insignificant for the energy density and energy flux (hence the general reliance on these values and T(RMS) in many studies).

A related problem also visible on Day 178 is the intense electron flux below about 20-50 eV. These fluxes are in general not believed to be true ambient fluxes but a superposition of photoelectrons and secondaries trapped in the fields around the spacecraft. It is very difficult to accurately judge which are true ambients and which are these contaminants. As ATS-5 does not measure below 50 eV, it is impossible to judge whether these effects occur at all. For ATS-6, one of us (B. Johnson) has carefully gone through every spectrogram and, by hand, terminated the moment integrals at the energy (see tape listings) below which the contaminants

began to appear. Although great care was exercised, the absolute electron densities for ATS-6 should be considered somewhat (~factor 2) circumspectly. Again, however, this effect damps out quickly with the higher moments, the density appearing to be the only moment significantly affected.

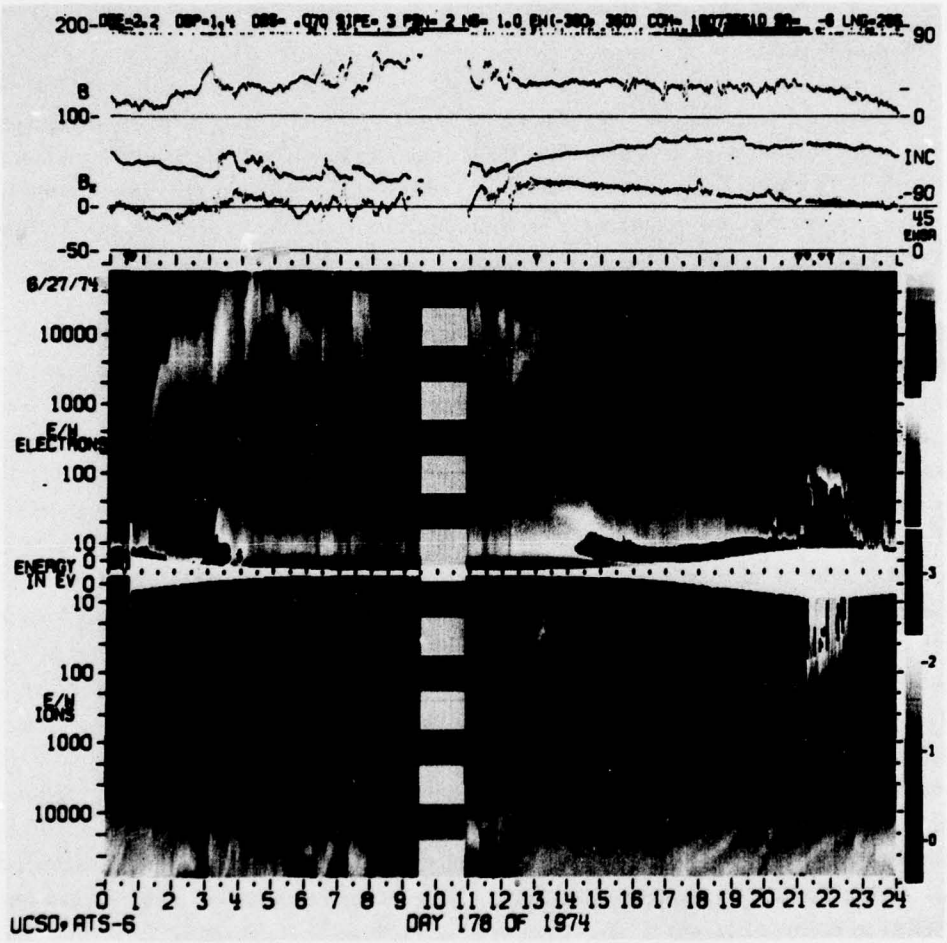

Figure 1. Spectrogram of ATS-6 Particle Fluxes for Day 178 of 1974 (Local Midnight is ~0600 UT). Note the high daylight potential near 0415 UT of -2000 V

Charging of the spacecrafts by the ambient plasma, as already mentioned in regards to Day 178, is also a source of significant error in moment determinations. The effect, produced generally by a buildup of negative charge on the whole or portions of the satellite owing to the higher (~40×) velocities of the electrons over the ions,

causes a marked reduction in the electron moments and an increase in the ions. Charging can occur at all times though the highest voltages have been observed only in eclipse. Two types of charging are primarily observed—charging between the satellite and space and charging between portions of the spacecraft. Charging, as described earlier, manifests itself primarily as a dropout of particles having energies below the potential of the spacecraft—usually observable in the low energy ions. DeForest[5,6] and Garrett et al[7] carefully review many examples of this phenomena.

For the purpose of this study, B. Johnson has carefully corrected all ATS-6 data for potential variations and the potential has been recorded (see tape formats). For ATS-5, the processing technique and low energy resolution limit of the detector prevented this. Specifically, Days 271, 272, 273, and 274 of 1970 all had eclipses though only the data within ± 30 min 0630 UT on Days 272 and 274 show any effect that might justify removal. Days 313, 324, and 325 of 1969 and Days 322, 325, and 327 exhibit charging but the time periods are short and the effects are not apparent in the moment calculations.

S. DeForest has carefully reviewed the difficulties associated with potential corrections for ATS-5 and ATS-6 and the attendant problem that they in general do not cover the same energy ranges (the ATS-6 energy range in fact being variable at low energies). He finds errors less than 20 percent for uncorrected potentials below -50V. Within the ranges of our data, a factor of 2 error is probably a realistic "worst case". As this is much smaller than the actual variations in the plasma (~100) in time periods of tens of minutes, we doubt that such errors are significant in such a large data base as considered here.

Other problems that must be considered but cannot at this time be corrected are the lack of precise data on the extremely low energy environment ($\lesssim$ 10 eV), ion composition, and anisotropies. In the case of the low energy environment, Lennartsson and Reasoner (1978) have employed ATS-6 data to estimate the low energy ion population and their paper should be consulted for estimates. Direct measurements by the GEOS satellites will appear shortly. G. Wrenn (private communication) has indicated large densities (~50/cm^3) below 50 eV, disappearing, however, with increased geomagnetic activity. In any case, the electron and ion densities are in general very close to each other (varying only by a factor of 2 to 3 at the most) for the data presented here indicating that, for the approximate range of accuracy of

5. DeForest, S.E. (1972) Spacecraft charging at synchronous orbit, J. Geophys. Res. 77(No. 4):651.

6. DeForest, S.E. (1973) Electrostatic Potentials Developed by ATS-5, Photon and Particle Interactions with Surfaces in Space, R.J.C. Grand (ed.) D. Reidel Publishing Co., Dordrecht, Holland, pp 263-276.

7. Garrett, H.B., Pavel, A.L., and Hardy, D.A. (1977) Rapid Variations in Spacecraft Potential, AFGL-TR-77-0312.

measurements (~50 eV to 50 keV), the results are an adequate if not an accurate reflection of the true density. Again the higher moments are little affected by errors in the low energy density. As regards the ion composition the reader is referred to the review by Young.[8] The distribution of field-aligned fluxes are almost totally unknown — the SCATHA program and GEOS will hopefully provide answers. Some estimate can be made, however, by comparing the ATS-5 perpendicular and parallel (to the satellite spin axis) detector data. As is revealed in the data anisotropy clearly exists and can at times be quite pronounced. For analysis purposes we normally average the two detectors in order to better estimate the omnidirectional fluxes. As the ATS-6 data are only for the North-South (relative to the earth's axis) detector, directional effects cannot be estimated.

5. CONCLUSIONS

In the preceding sections we have briefly discussed the data sources, how the data were used to calculate the moments, how to calculate other useful quantities, and problems associated with the data and their interpretation. In this section, we will describe the general form in which the data are available and suggest possible uses.

Several sets of information have been provided in this pictorial atlas. The first of these are daily spectrograms of ATS-5 and ATS-6 data such as presented in Figure 1. The energy scales are slightly different for ATS-5 and ATS-6 (see Appendix A) but otherwise the spectrograms are identical in their presentation. Accompanying each spectrogram are daily line plots of the 10-min averages of the four moments of the distribution functions for the electrons and ions. In the case of ATS-5 the solid lines are the perpendicular components and the dashed lines are the parallel components. The units are defined in the Appendix.

In Appendix B we have included the orbital elements of ATS-5 and ATS-6. These consist of 2 types of plots. The first of these is the geographic longitude of the satellite vs the geographic latitude. The start and stop times in Universal Time (UT) are given at the top of the page. Along the orbital track is listed the local time at various locations. Also indicated is the time of minimum latitude or start and stop time. The second type of plot consists of the radial position (in geographic coordinates) of the satellite as a function of UT (Jan 1 ~ Day 1).

The final two Appendices contain the harmonic plots of the K_p index (Solar-Geophysical Data - Prompt Reports, 1970, 1971, 1975, 1977) and listings of the formats of the 2 CDC 6600 tapes available with this report.

The details of these formats are explained in the appendix.

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8. Young, D. T. (1979) Ion composition measurements in magnetospheric modeling, Quantitative Modeling of the Magnetospheric Processes, Geophys. Monogr. Ser., 21, W. P. Olson (ed.) AGU, Washington, D. C.

The four appendices and the two computer tapes are useful in a variety of geophysical and engineering applications. In various reports (DeForest and McIlwain,[2] Su and Konradi,[9] Garrett,[10] Garrett et al,[4] DeForest,[11] and Garrett and DeForest[12]), the ATS-5 and ATS-6 data have been extensively exploited in order to model the geosynchronous environment. The reader is referred to these reports and the review by Garrett[1] for details.

The data presented here have been and are being carefully analyzed in order to establish the baseline low-energy geosynchronous plasma environment observed by ATS-5 and ATS-6. The documented results have already revealed many new features. The data are readily useable as they are in order to simulate actual geophysical variations likely to be encountered at geosynchronous orbit. Further, they can be analyzed to provide detailed information on variations at various local times and under varying geophysical conditions. Cross-correlations between various parameters including the solar wind and DMSP photos are hoped for in the future. In all, it is felt that the data base presented in this report represents, at present, the most readily accessible data for general use on the geosynchronous environment.

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10. Garrett, H. B. (1977) Modeling of the Geosynchronous Orbit Plasma Environment - Part I, AFGL-TR-77-0288.

11. DeForest, S. E. (1979) Final Report for Contract F19628-77-C-0014, Atlas of the Geosynchronous Plasma Environment, AFGL-TR-79-0100.

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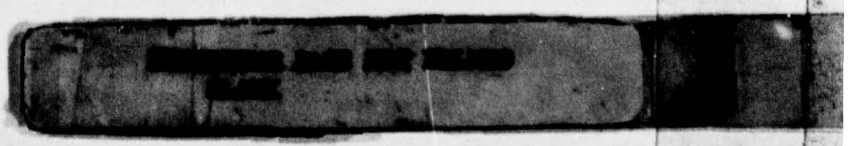


Appendix A

ATS-5 and ATS-6 Spectrograms and Line Plots

This appendix contains spectrograms and line plots for the ATS-5 and ATS-6 days listed in Table 1. As indicated in the text these data have as far as possible been corrected for potential variations, bad data, and temperature effects. Each day consists of a spectrogram and line plot, the spectrogram being for either the parallel (indicated by a "$\parallel$" on the left hand side) or perpendicular (indicated by an "$\perp$") detector for ATS-5 and for the North-South detector on ATS-6. The line plots for ATS-5 show the 10-min averages of the four moments of the distribution function for the parallel (---) and perpendicular (—) detectors. The ATS-6 data are only for the North-South detector.

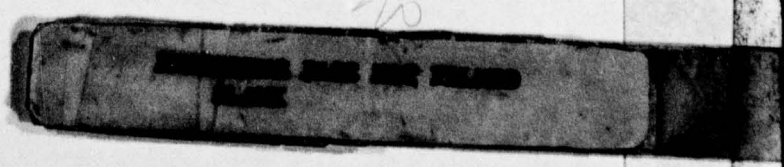
The spectrograms are to be interpreted as follows. For both satellites the local time position of the satellites are given in Appendix B (roughly, local midnight was at ~0630 UT for ATS-5, ~0600 UT for ATS-6 in 1974, and ~2100 UT for ATS-6 in 1976), Universal Time being given along the X-axis. In the case of ATS-5 the Y-axis energy is a logarithmic scale with 50 eV at the bottom (top) for electrons (ions) and a scale proportional to $1/(E+3\ \text{keV})$. The gray scale at the lower right determines the value of G on the scale marked 0 to 3. The differential energy flux in $\text{eV/cm}^2\text{-sec-ster-eV}$ is given by $(10^G-1)\ 10^{b+4.367}$ where b is given by "EL" in the lower left corner for electrons and "PR" for ions. The reader is referred to DeForest and McIlwain[2] for details of the other parameters plotted. The spectrograms for ATS-6 are practically identical, only with the scale being logarithmic in energy between 10 eV and 80 keV (linear below 10 eV). The values of "EL" and "PL" are not given. UCSD should be contacted directly for these values if desired.

The line plots are scaled so that whatever factors are indicated (either the power of 10 on the side scale or the factor of 2 in the upper right of some plots) should be multiplied by the indicated value to arrive at the final value. As an example, the ion energy density on day 312, 1969 should be multiplied by a factor of 10^3 and a factor of 4.

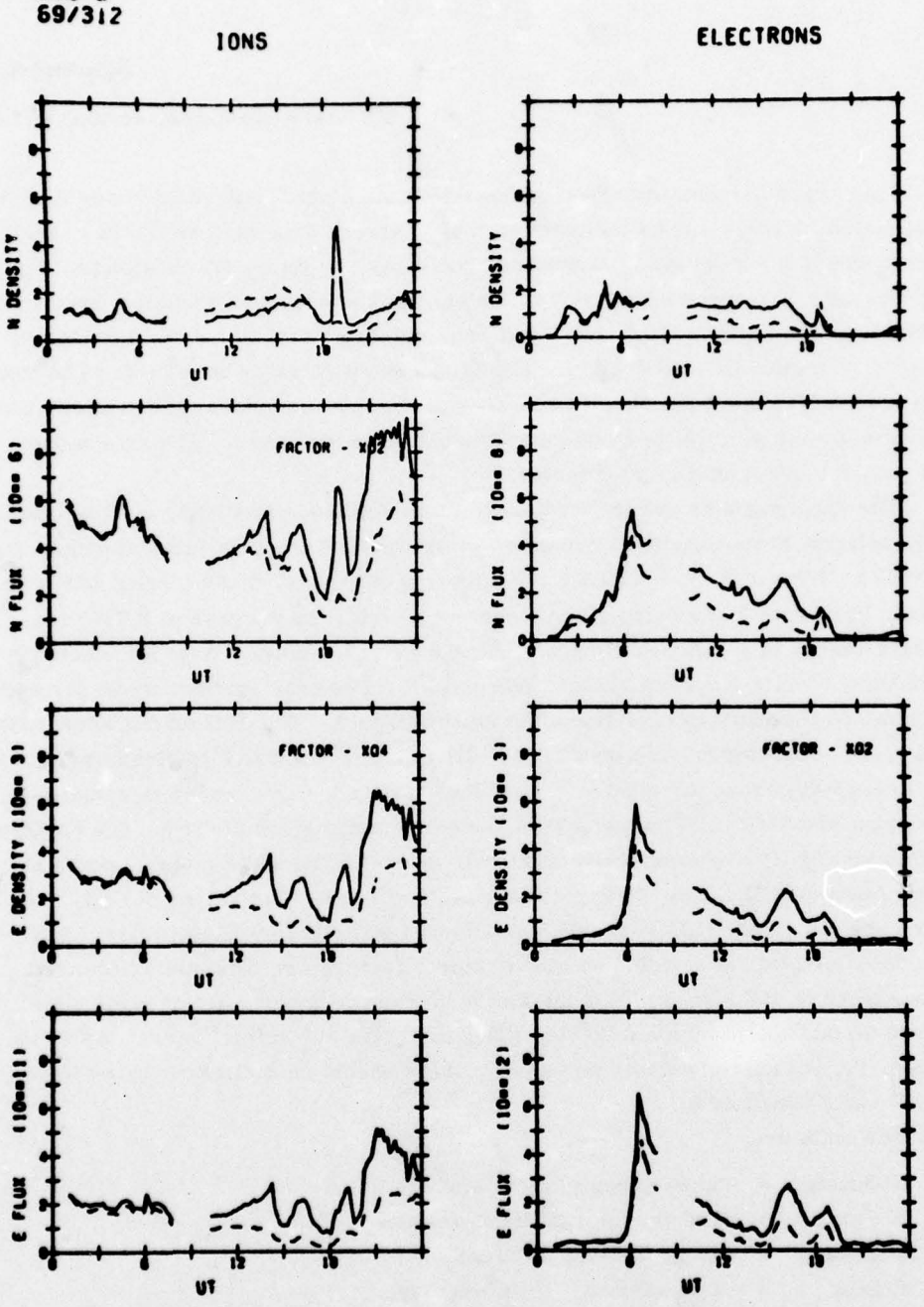
The units are:

N Density = number density = $N^\#/\text{cm}^3$
N Flux = number flux = $N^\#/\text{cm}^2\text{-sec-ster}$
E Density = energy density = eV/cm^3
E Flux = energy flux = $\text{eV/cm}^2\text{-sec-ster}$

The data are arranged chronologically.



ATS-5
69/312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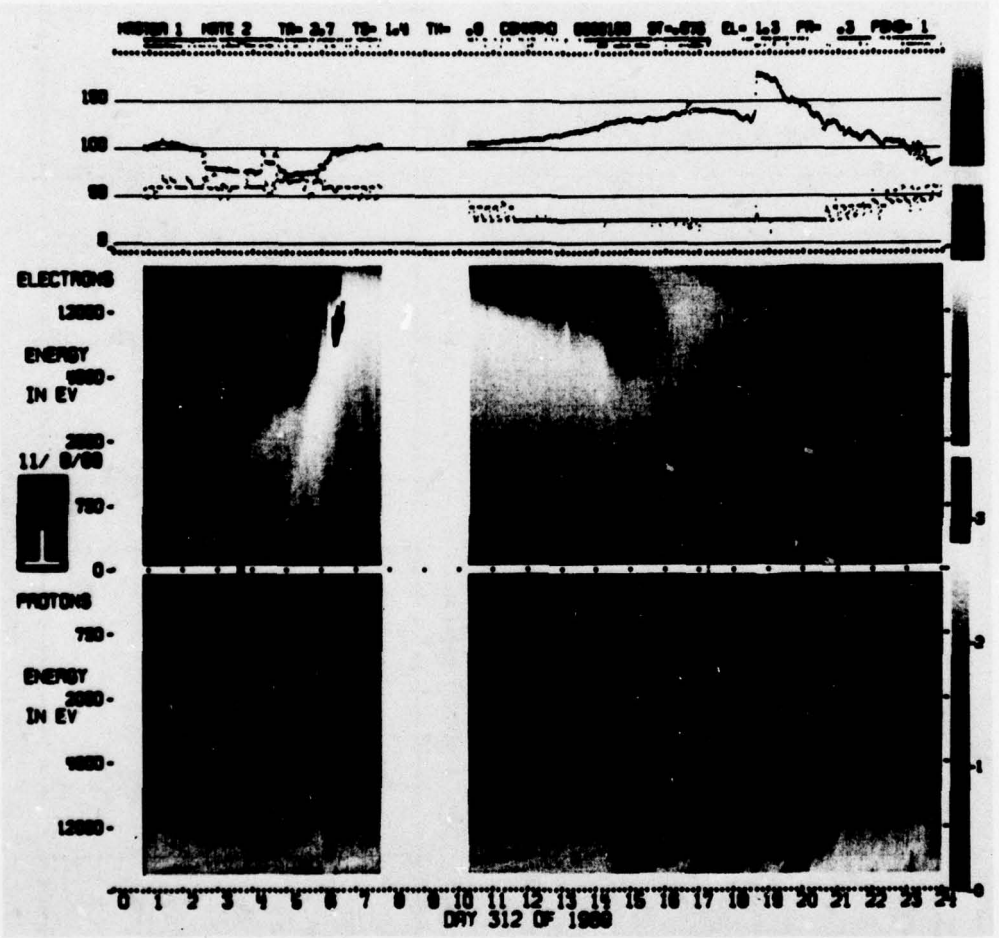
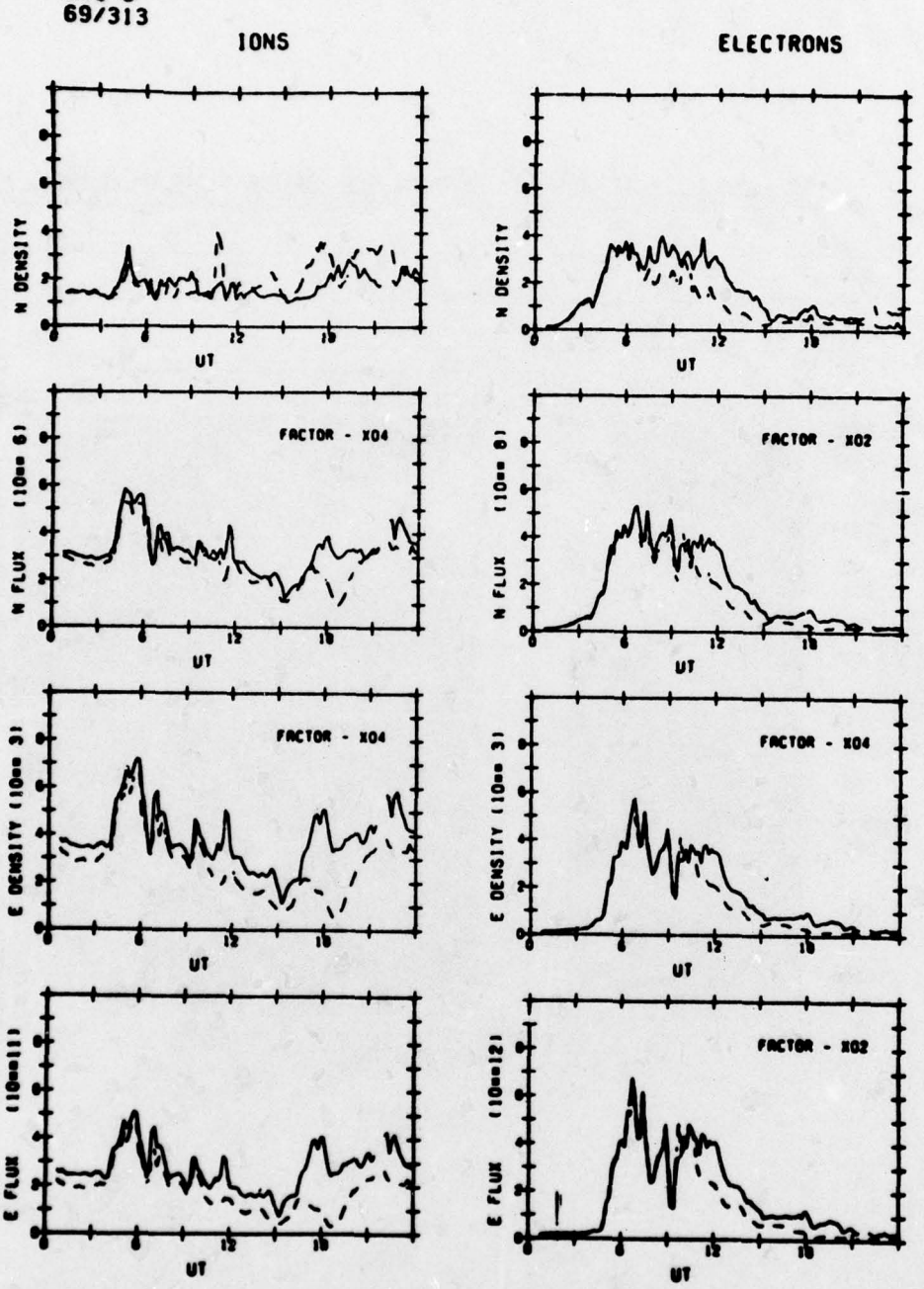
ELECTRONS
N DENSITY
N FLUX (10** 6)
FACTOR - X02
E DENSITY (10** 3)
FACTOR - X04
FACTOR - X02
E FLUX (10**11)
E FLUX (10**12)
UT
0
6
12
18
2
4
6
8


ELECTRONS
ENERGY
IN EV
PROTONS
ENERGY
IN EV
DAY 312 OF 1980

ATS-5
69/313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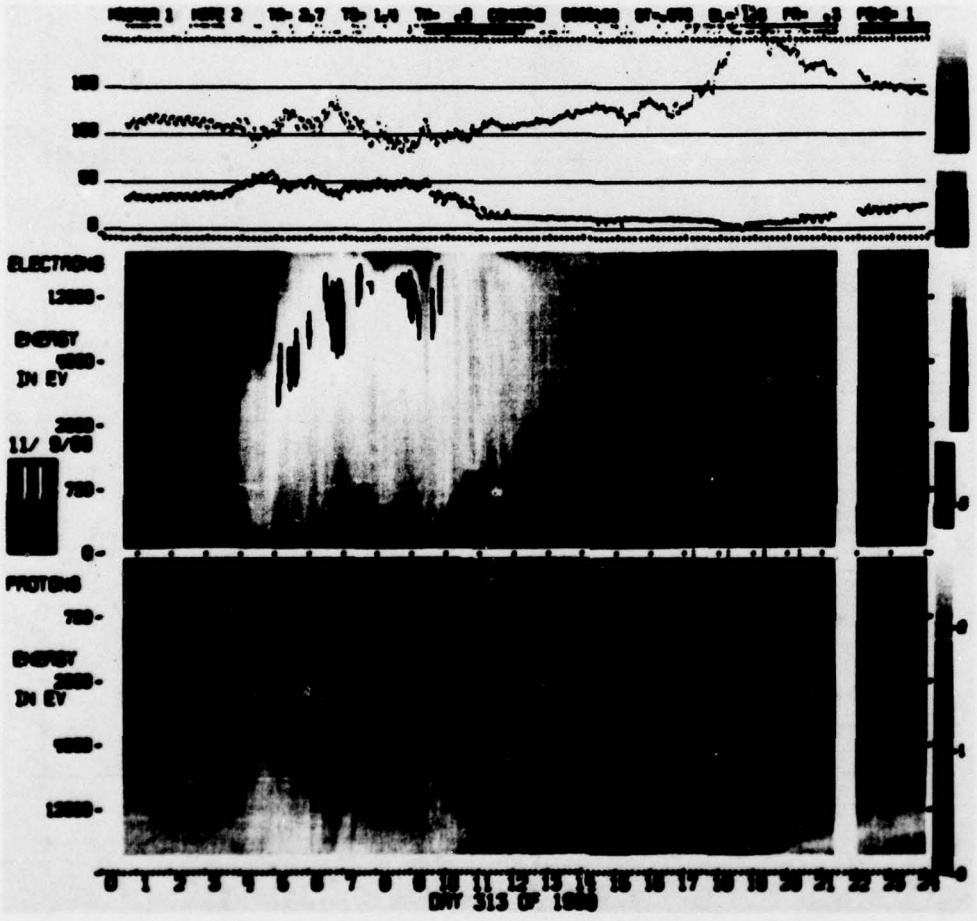
ELECTRONS
N DENSITY
N FLUX (10** 6)
FACTOR - X04
FACTOR - X02
E DENSITY (10** 3)
FACTOR - X04
FACTOR - X04
E FLUX (10**11)
E FLUX (10**12)
FACTOR - X02
UT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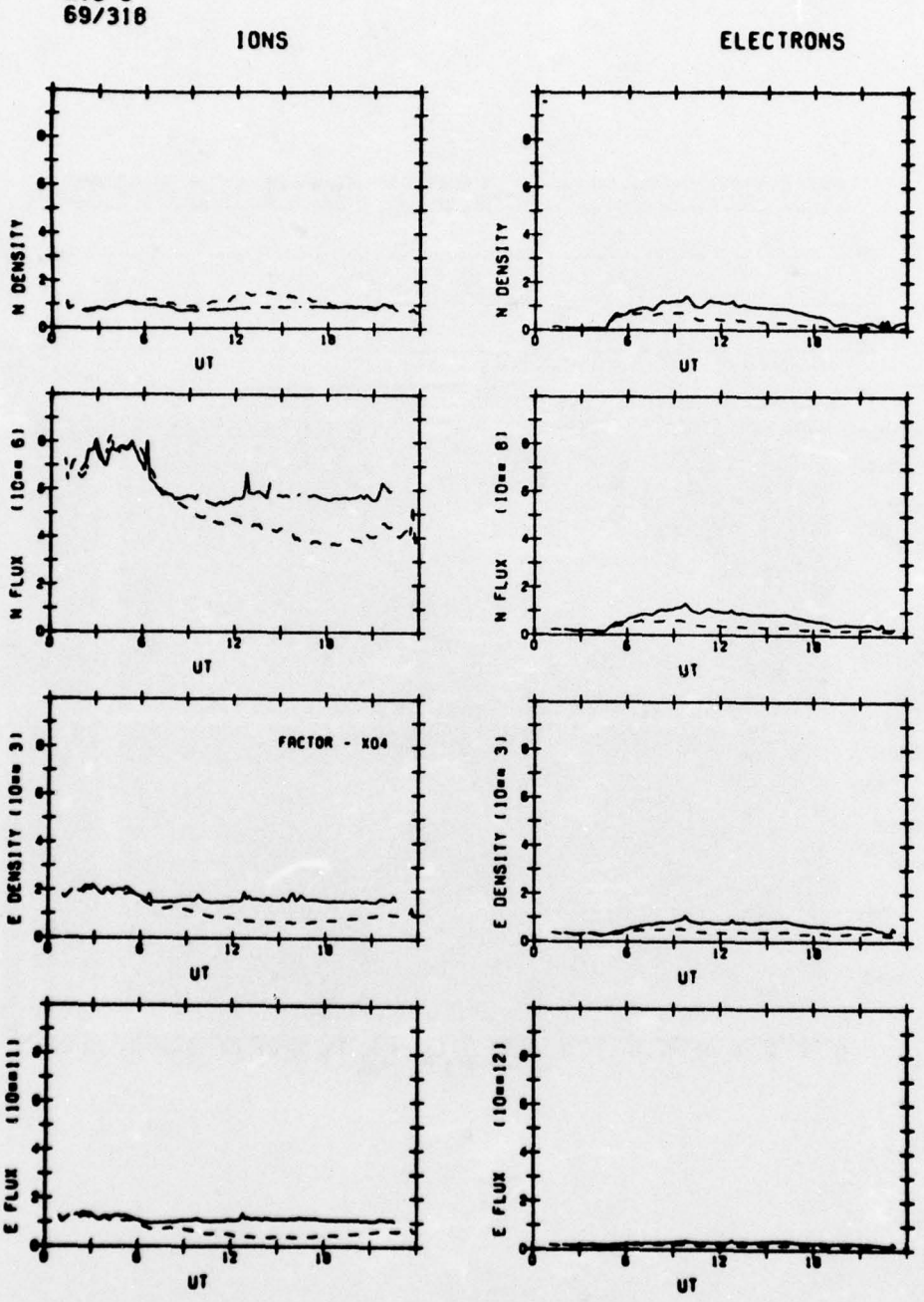
ENERGY
IN EV
PROTONS
ENERGY
IN EV
DAY 313 OF 1980

ATS-5
69/318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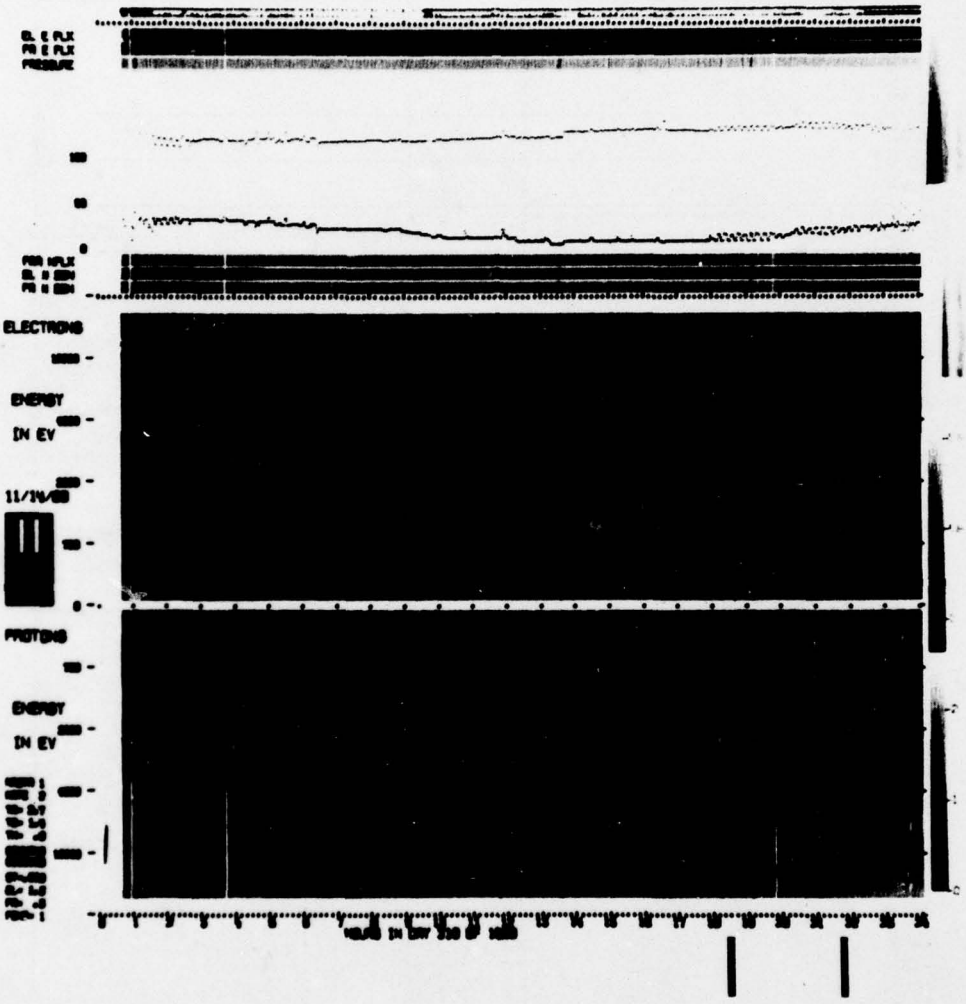
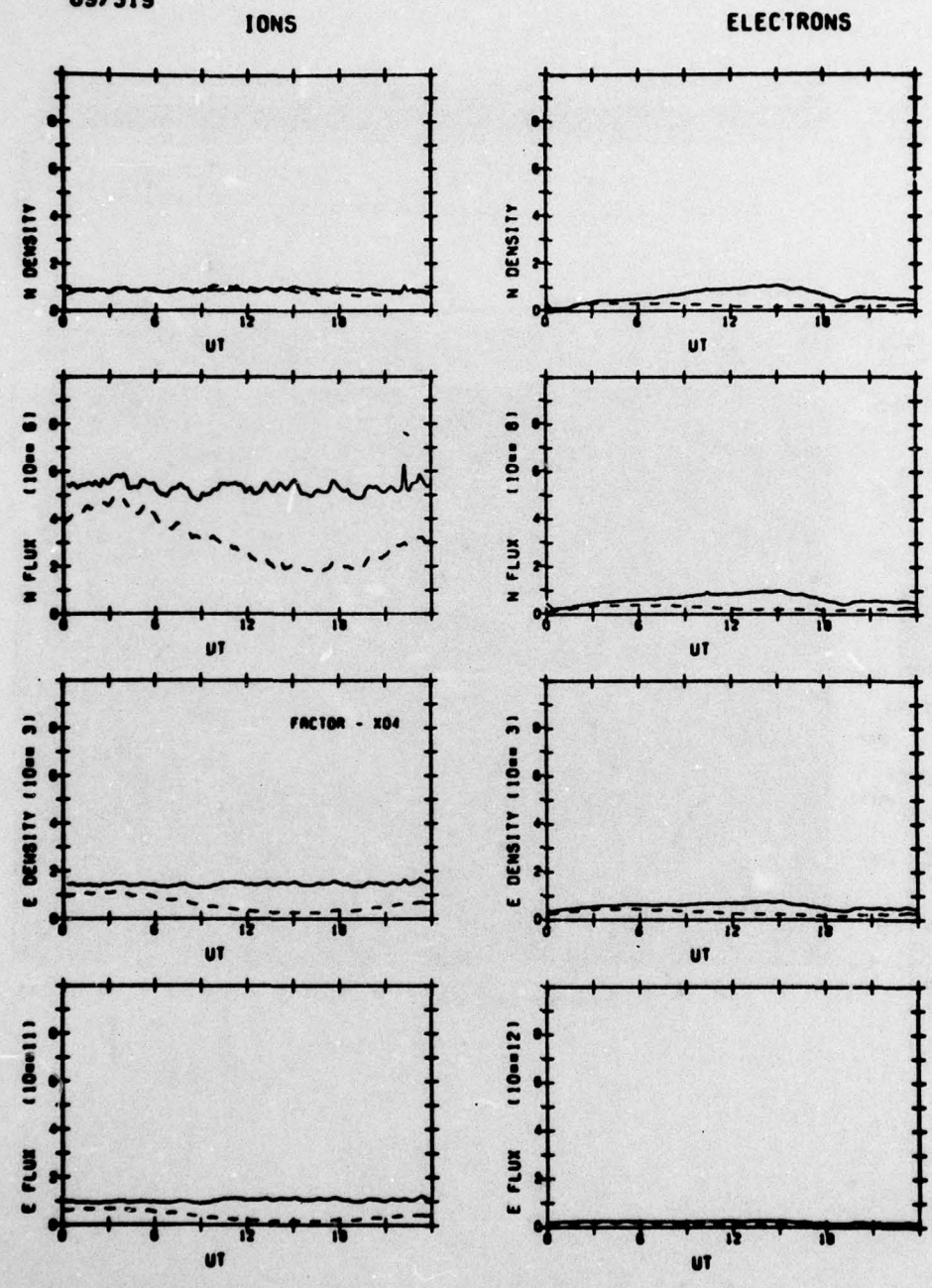
ELECTRONS
N DENSITY
N FLUX (10** 6)
E DENSITY (10** 3)
FACTOR - X04
E FLUX (10**11)
E FLUX (10**12)
UT
0
6
12
18
2
4
8


ELECTRONS
ENERGY
IN EV
PROTONS
ENERGY
IN EV

ATS-6
69/319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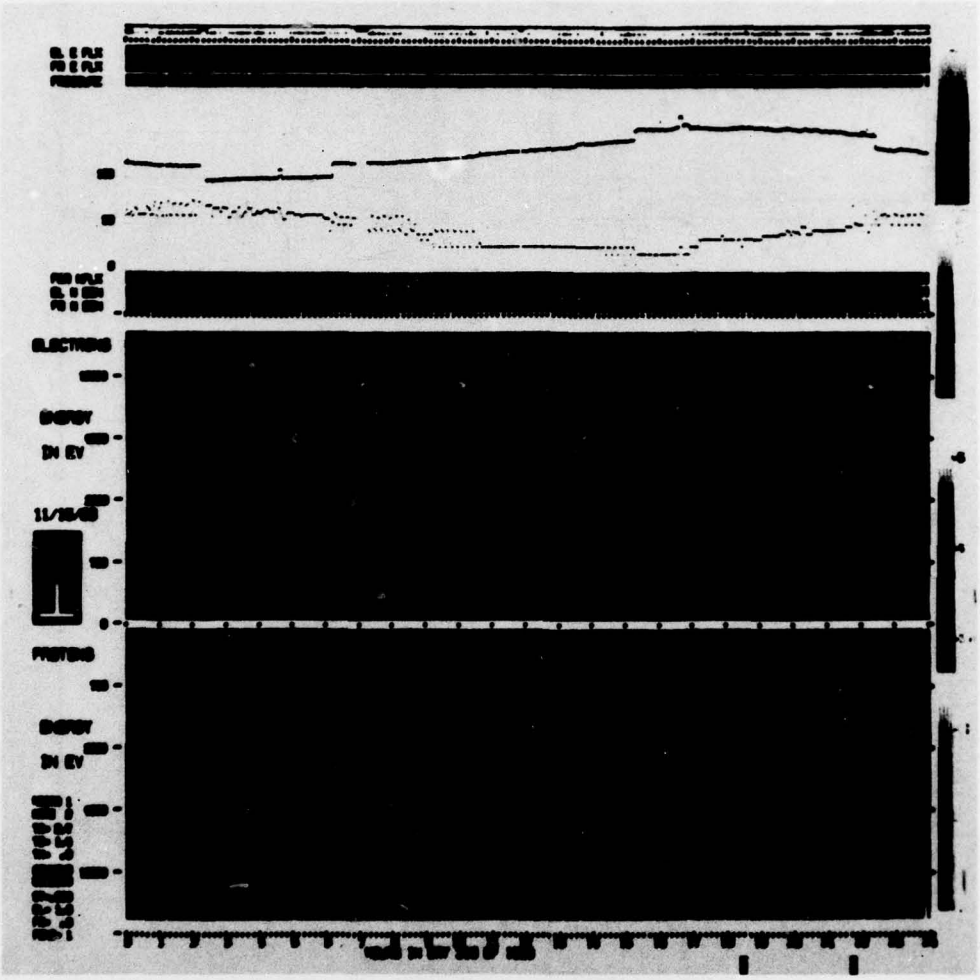
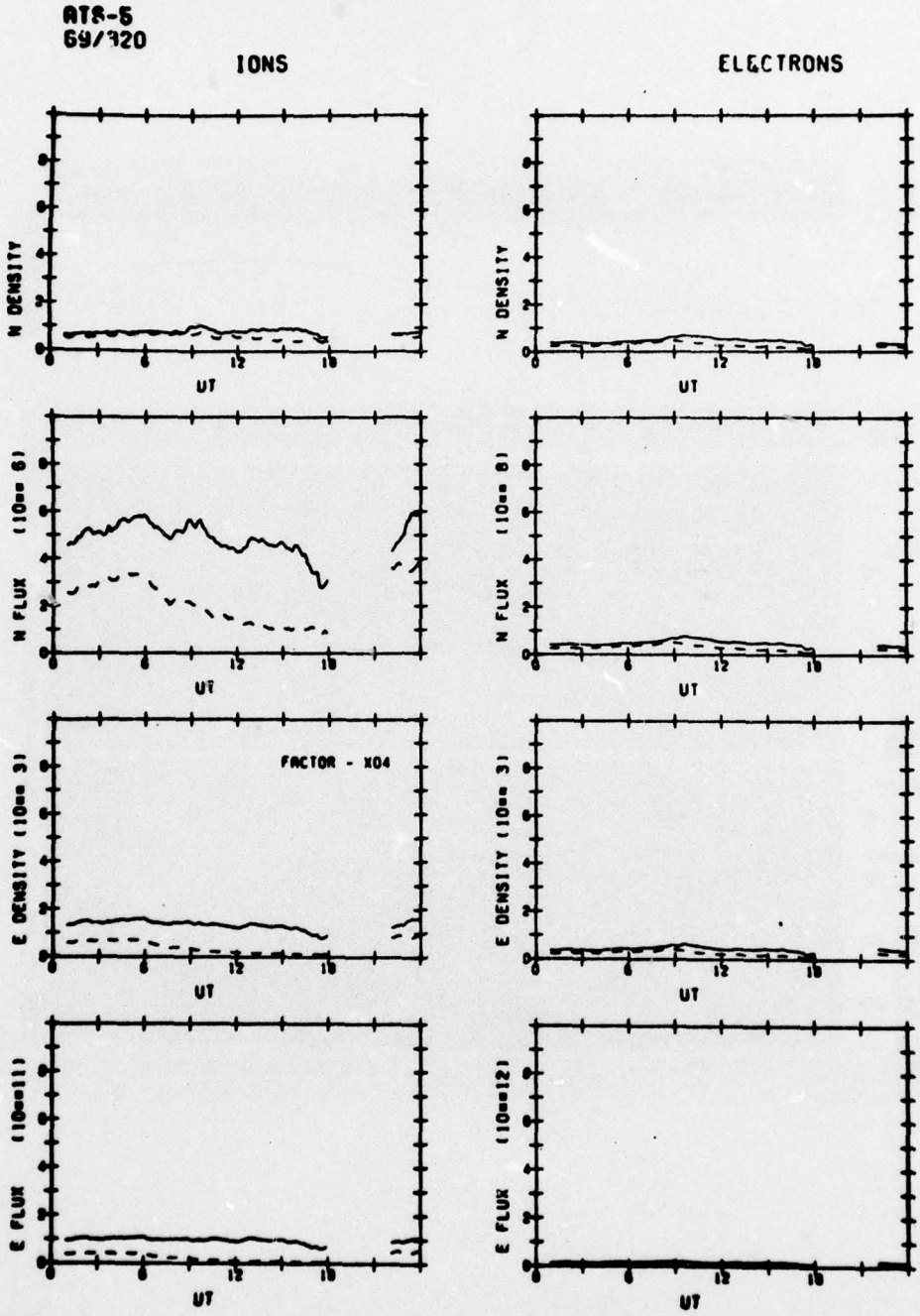
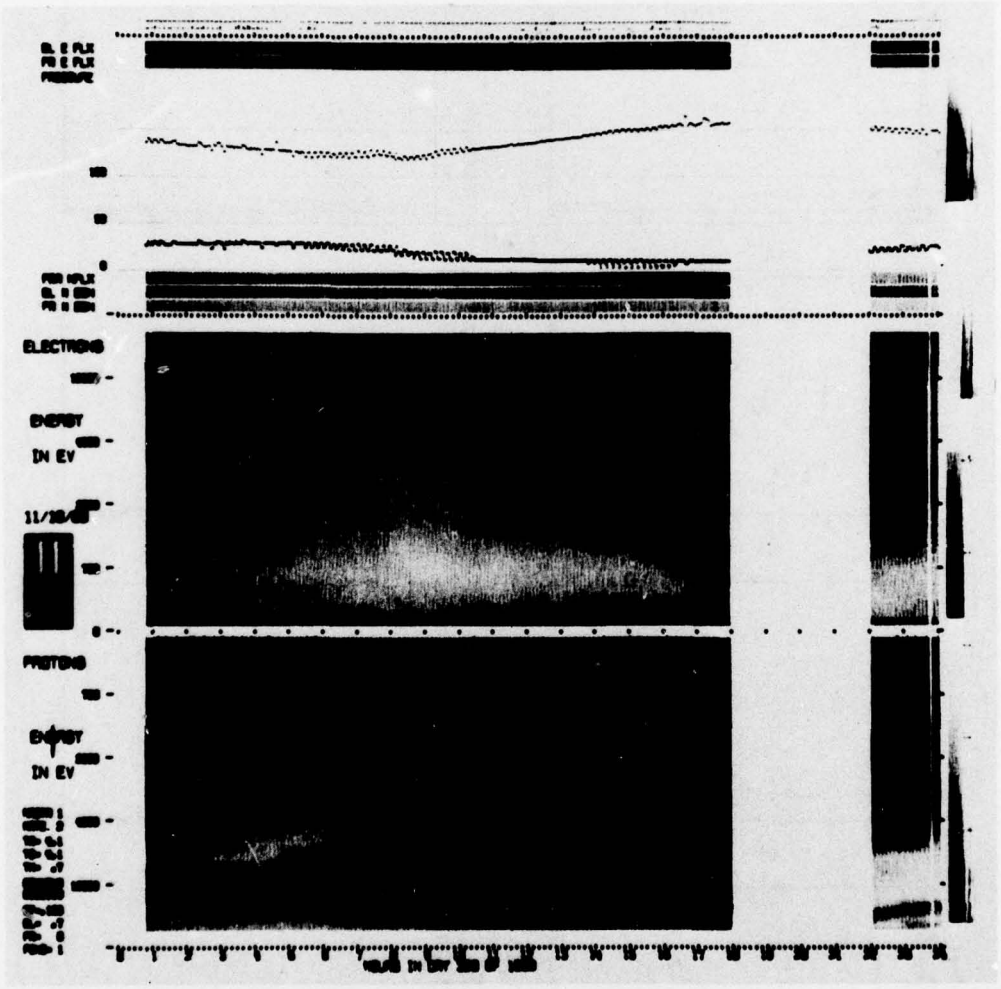
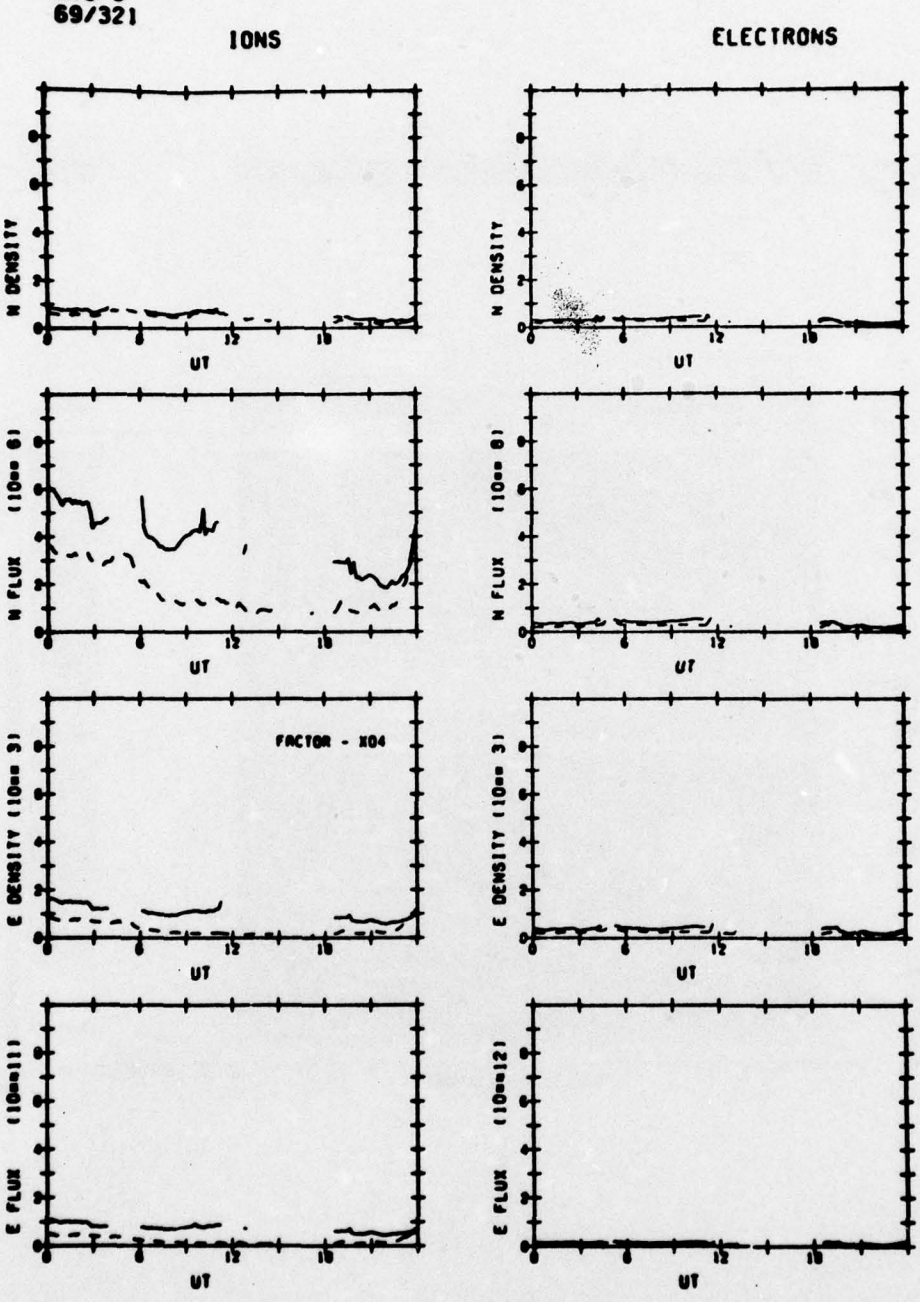
ELECTRONS
N DENSITY
N FLUX (10cm 6)
E DENSITY (10cm 3)
FACTOR - X04
E FLUX (10cm11)
E FLUX (10cm12)
UT
0
6
12
18

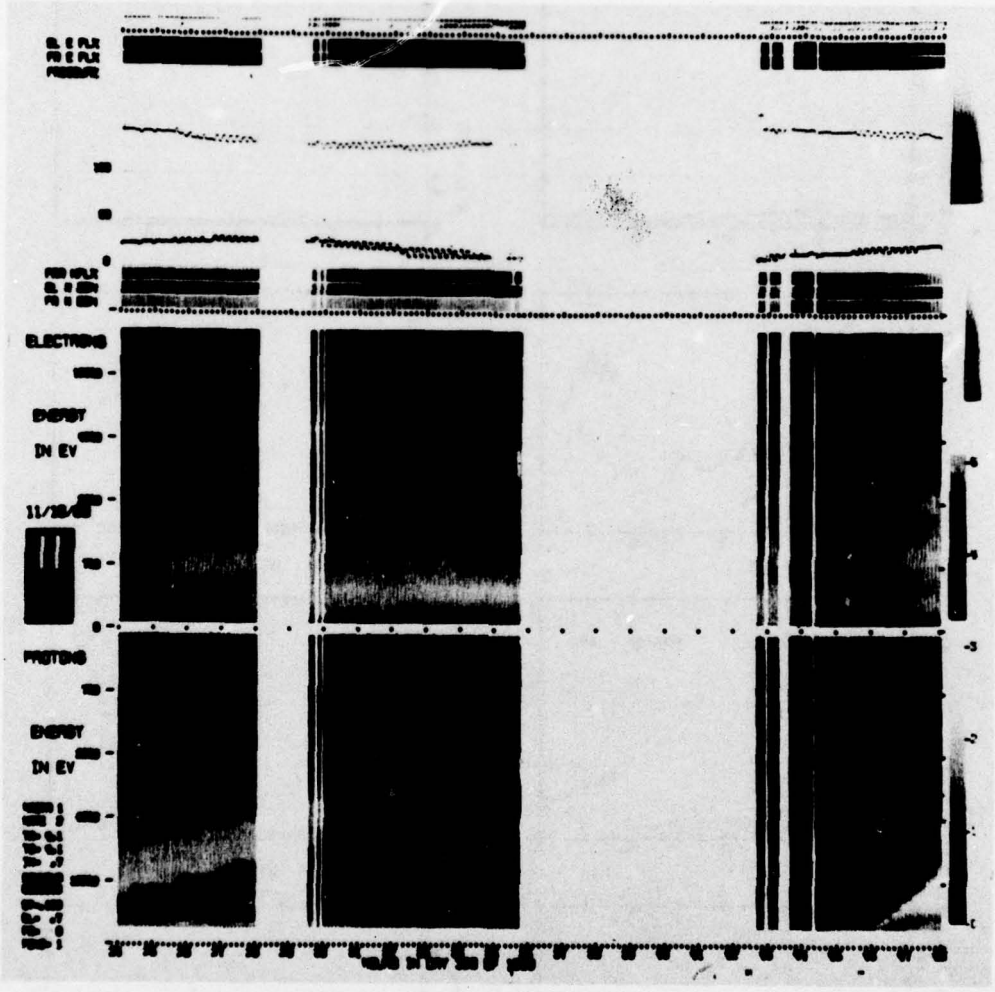


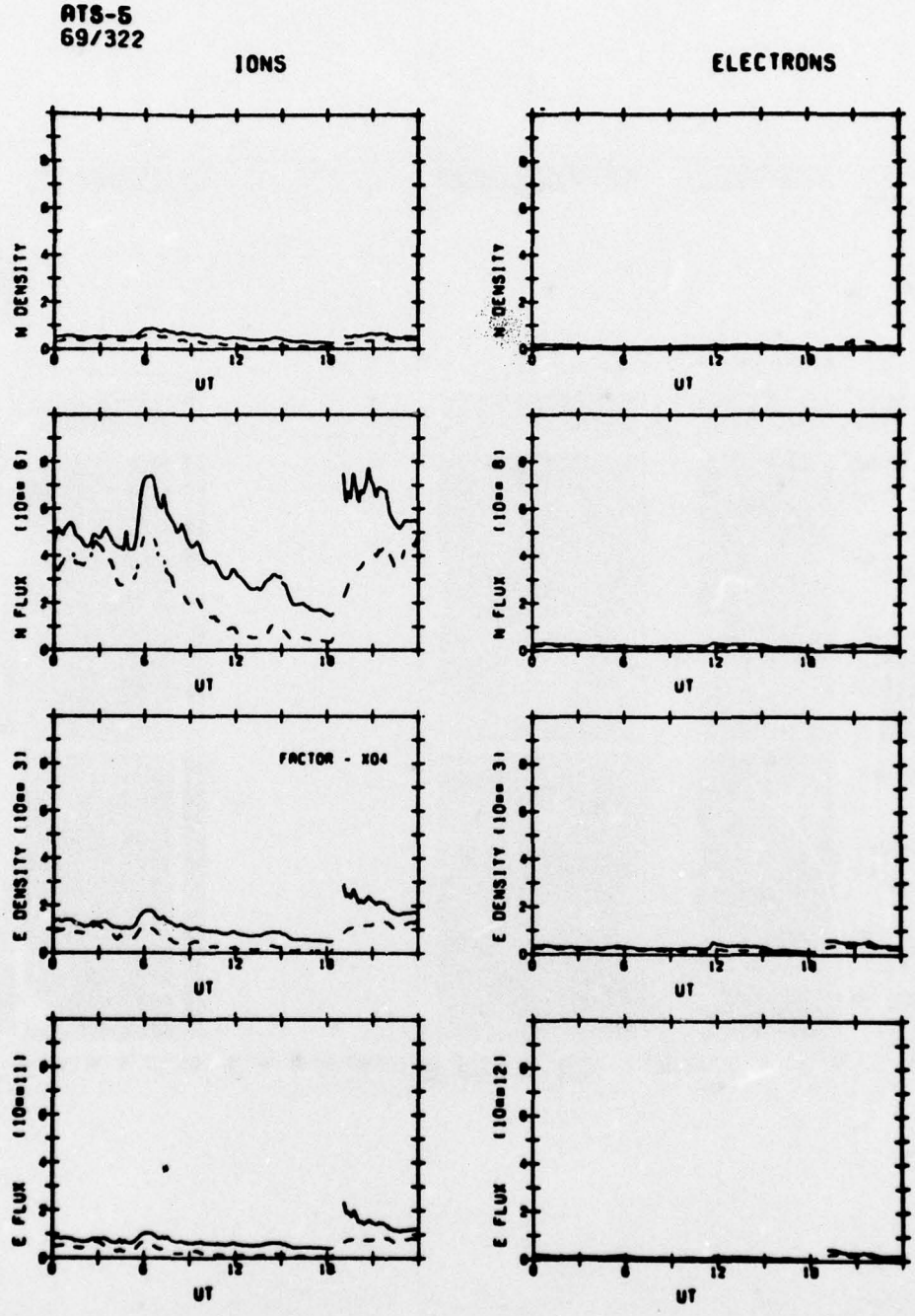

ATS-5
69/320
IONS
ELECTRONS
N DENSITY
N FLUX (10** 6)
E DENSITY (10** 3)
FACTOR - X04
E FLUX (10**11)
E FLUX (10**12)
UT
0
6
12
18
0
2
4
6
8

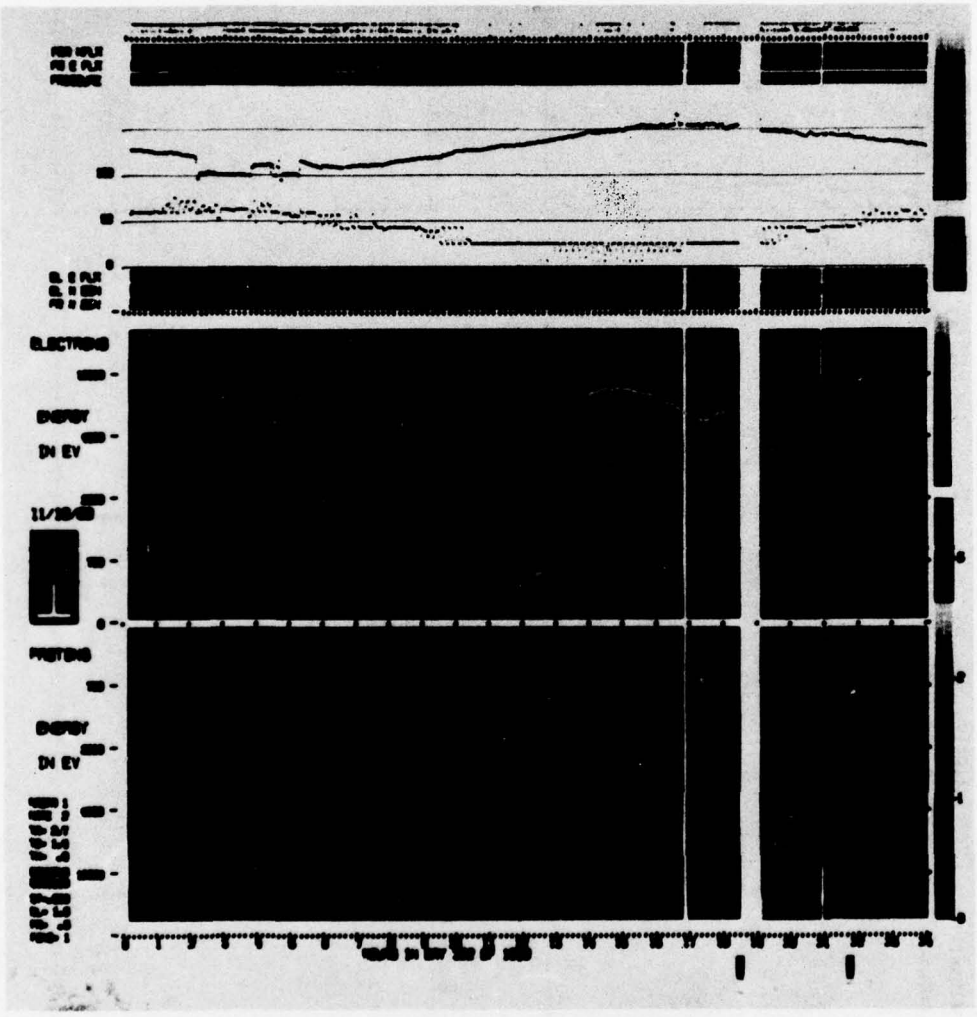

ELECTRONS
ENERGY
IN EV
PROTONS
ENERGY
IN EV

ATS-6
69/321

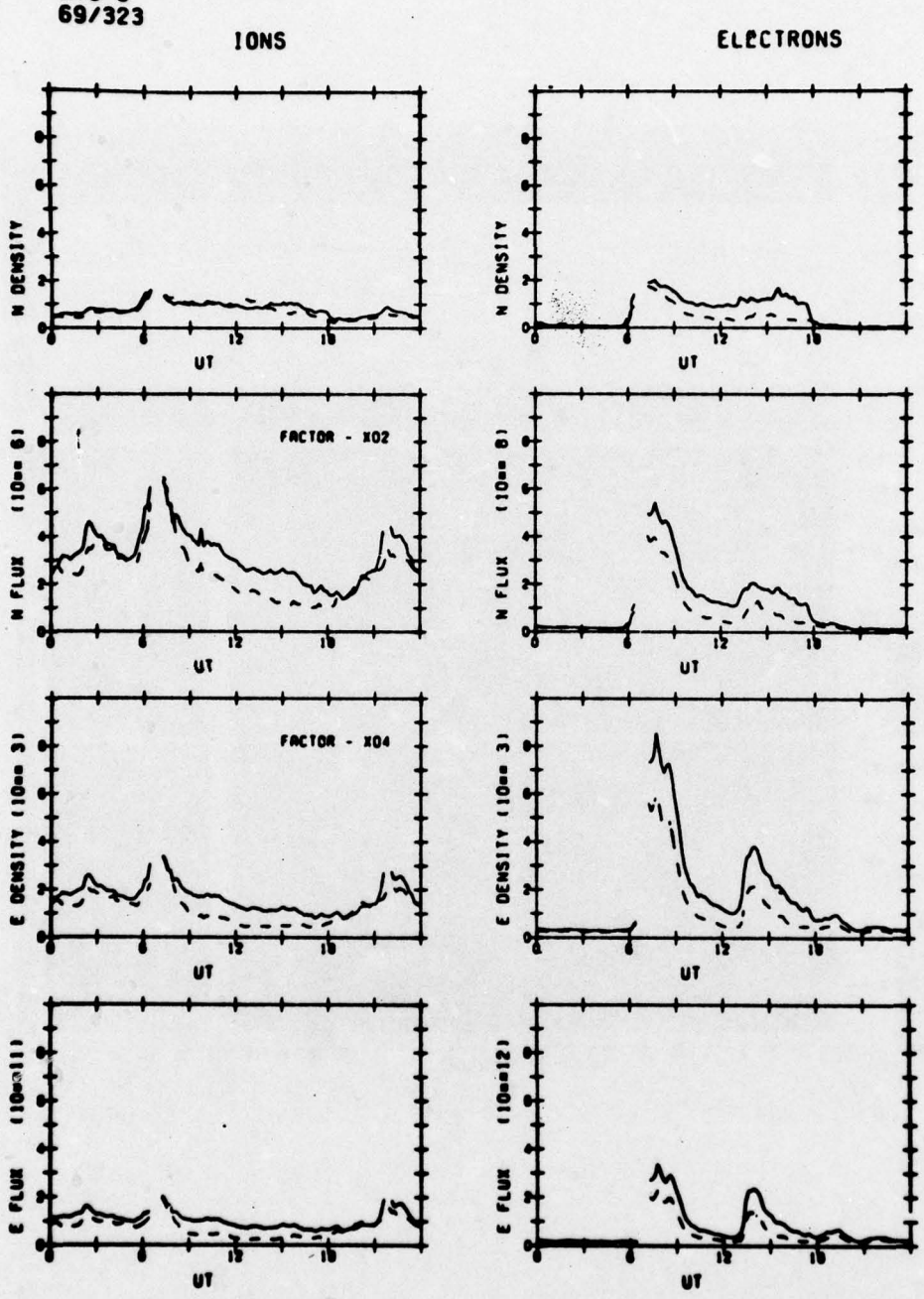

IONS
ELECTRONS
N DENSITY
N FLUX (10** 8)
E DENSITY (10** 3)
FACTOR - X04
E FLUX (10**11)
E FLUX (10**12)
UT
0
6
12
18


ELECTRONS
ENERGY
IN EV
PROTONS
ENERGY
IN EV


ATS-5
69/322
IONS
ELECTRONS
N DENSITY
N FLUX (10** 6)
E DENSITY (10** 3)
FACTOR - X04
E FLUX (10**11)
E FLUX (10**12)
UT
0
6
12
18
2
4
8



ATS-5
69/323


IONS
ELECTRONS
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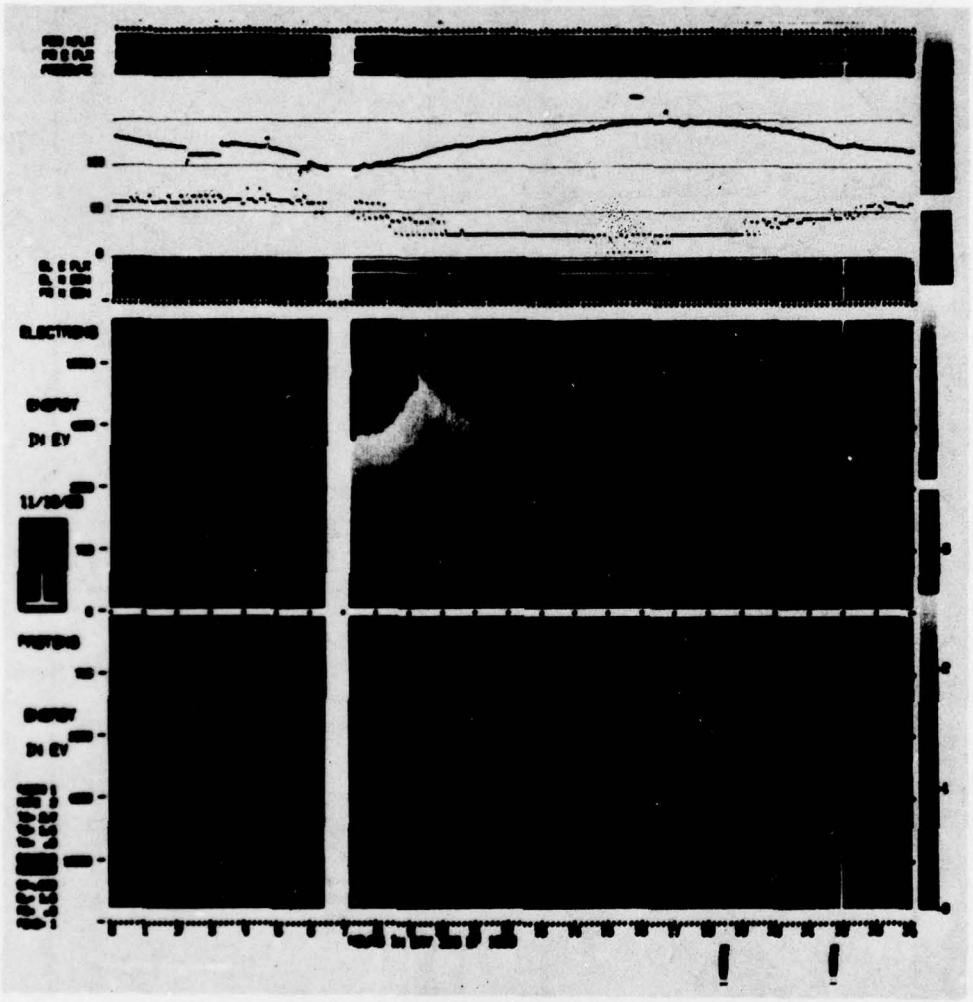
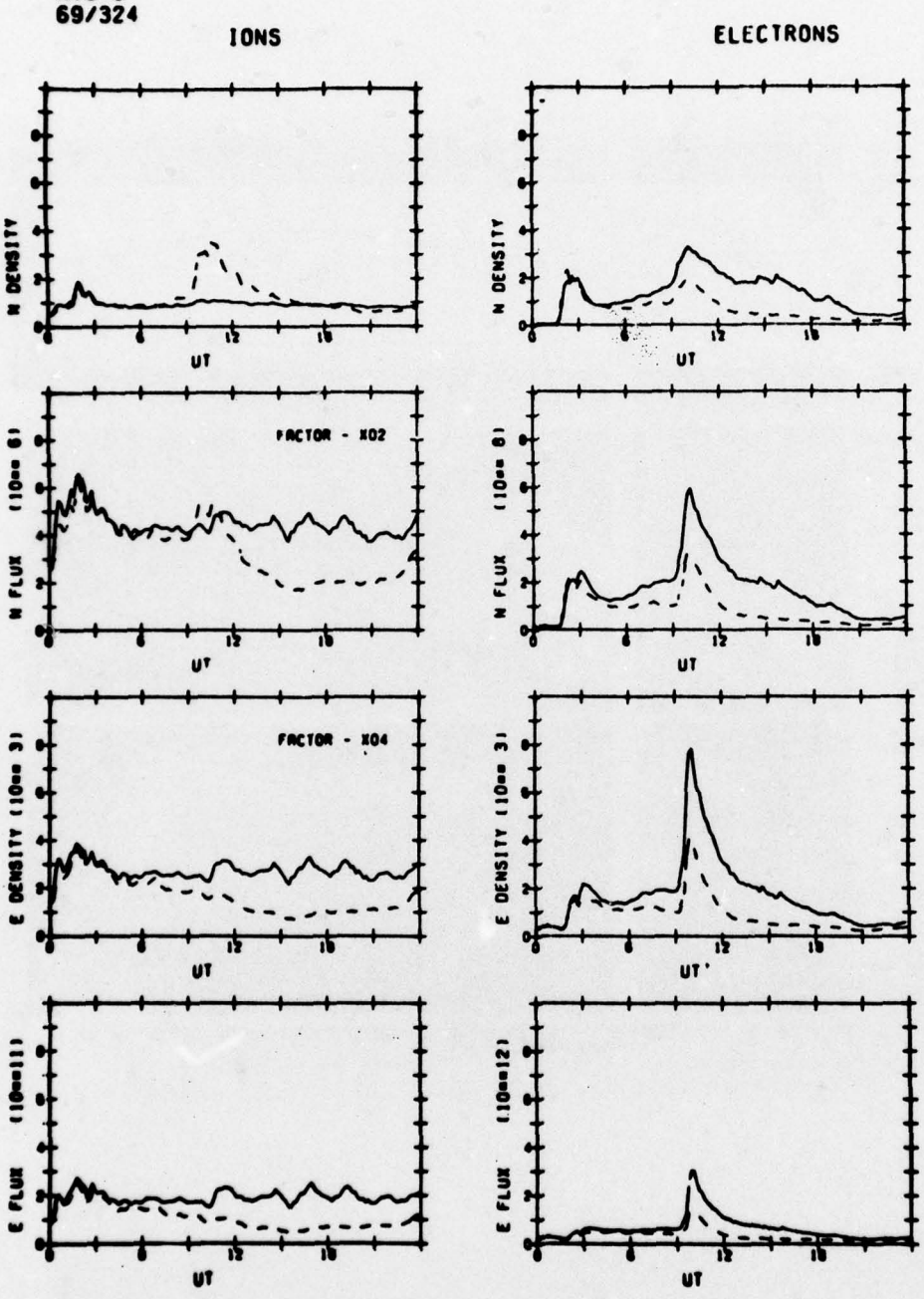
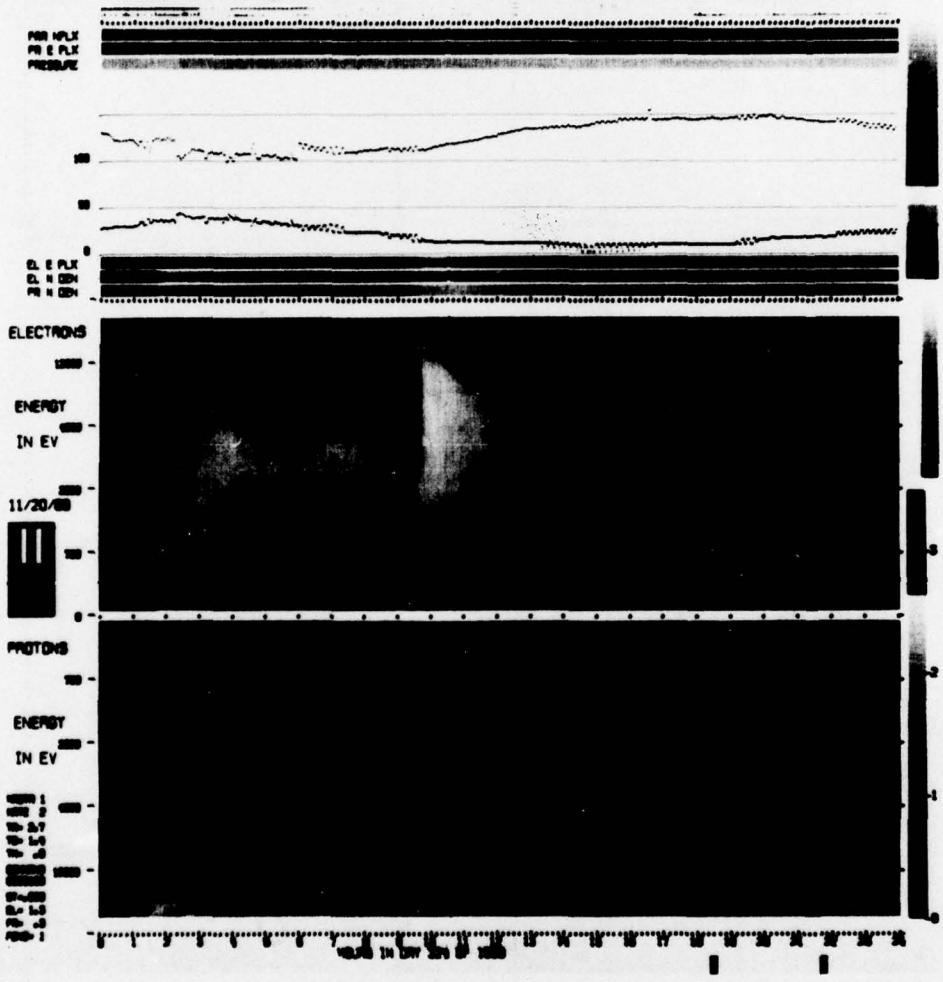
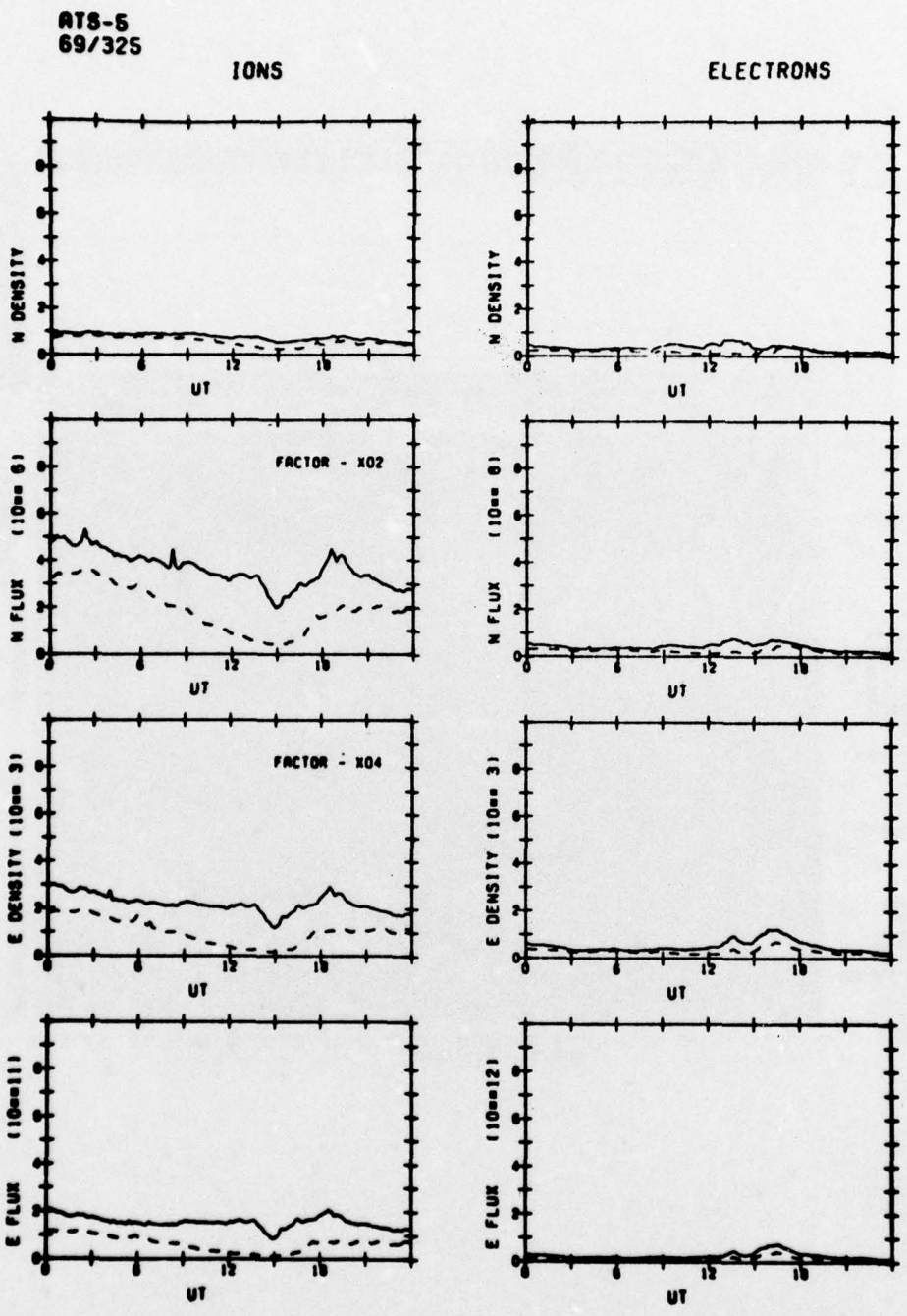
N FLUX (10** 6)
FACTOR - X02
N FLUX (10** 8)
E DENSITY (10** 3)
FACTOR - X04
E DENSITY (10** 3)
E FLUX (10**11)
E FLUX (10**12)
UT
0
6
12
18
0
2
4
6
8



ATS-6
69/324


IONS
ELECTRONS
N DENSITY
UT
FACTOR - X02
N FLUX (10** 6)
FACTOR - X04
E DENSITY (10** 3)
E FLUX (10**11)
E FLUX (10**12)


ELECTRONS
ENERGY
IN EV
11/20/68
PROTONS
ENERGY
IN EV


ATS-5
69/325
IONS
ELECTRONS
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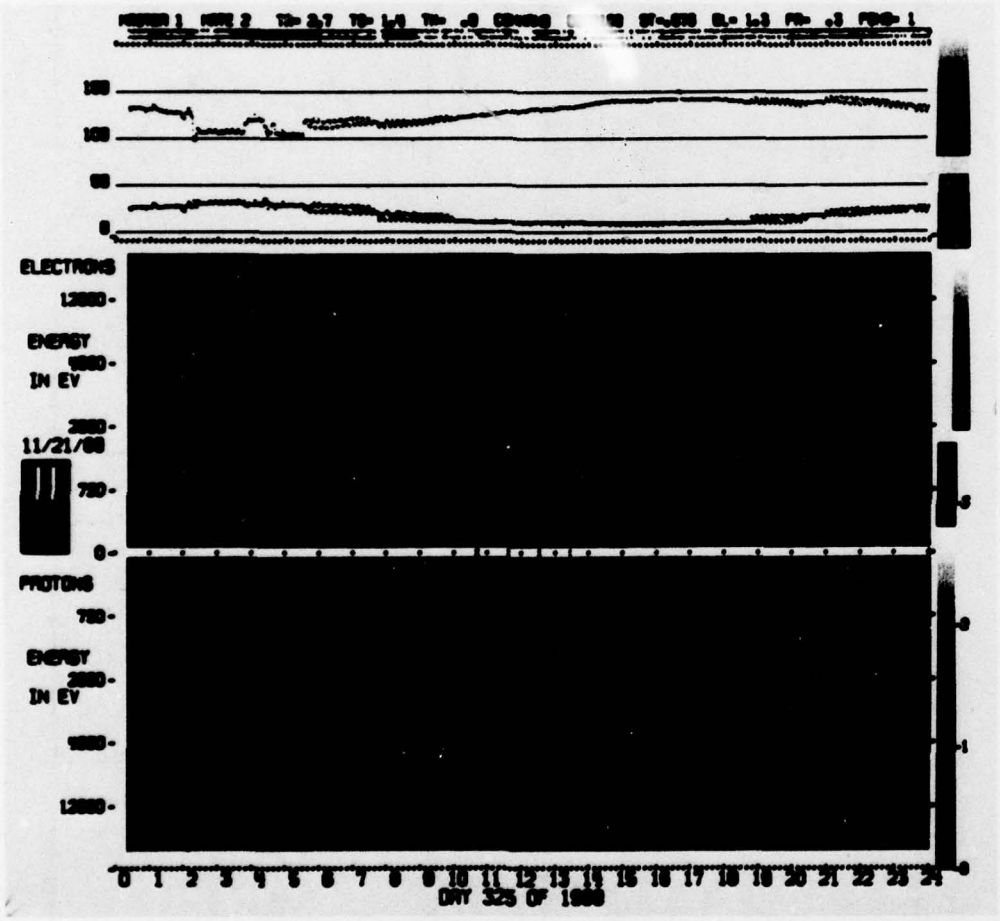
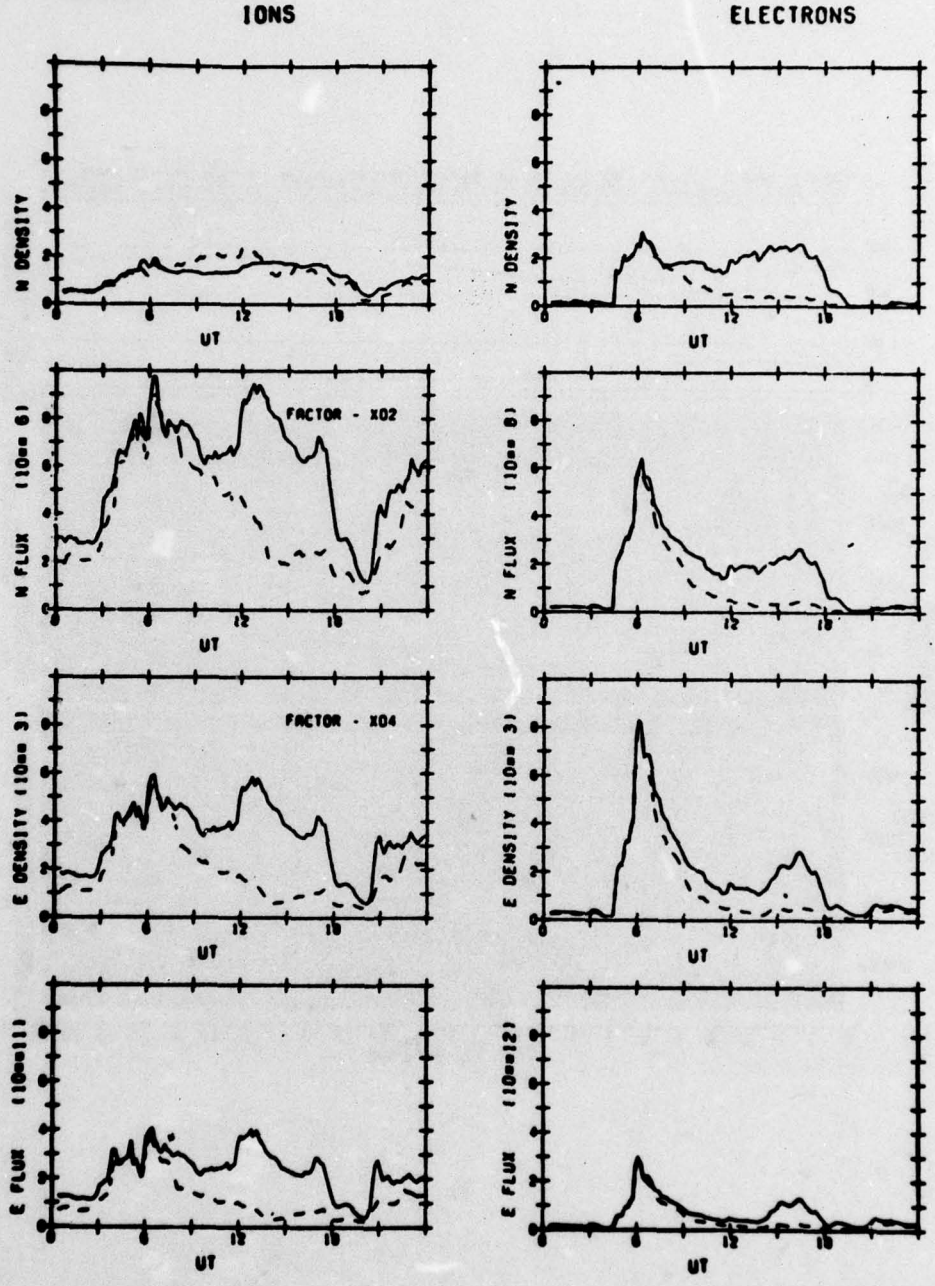
N FLUX (10** 6)
FACTOR - X02
E DENSITY (10** 3)
FACTOR - X04
E FLUX (10**11)
E FLUX (10**12)
UT
0
6
12
18


ELECTRONS
ENERGY
IN EV
11/21/68
PROTONS
ENERGY
IN EV
DAY 325 OF 1968

ATS-6
69/326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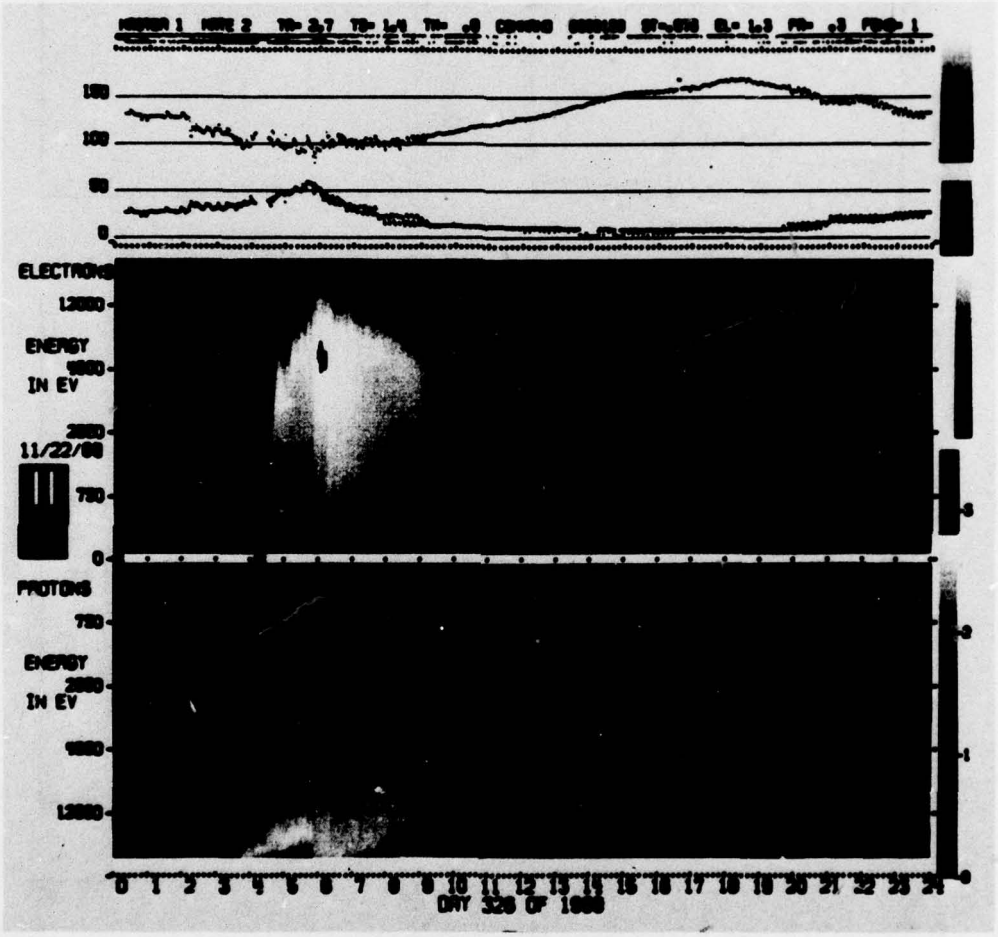
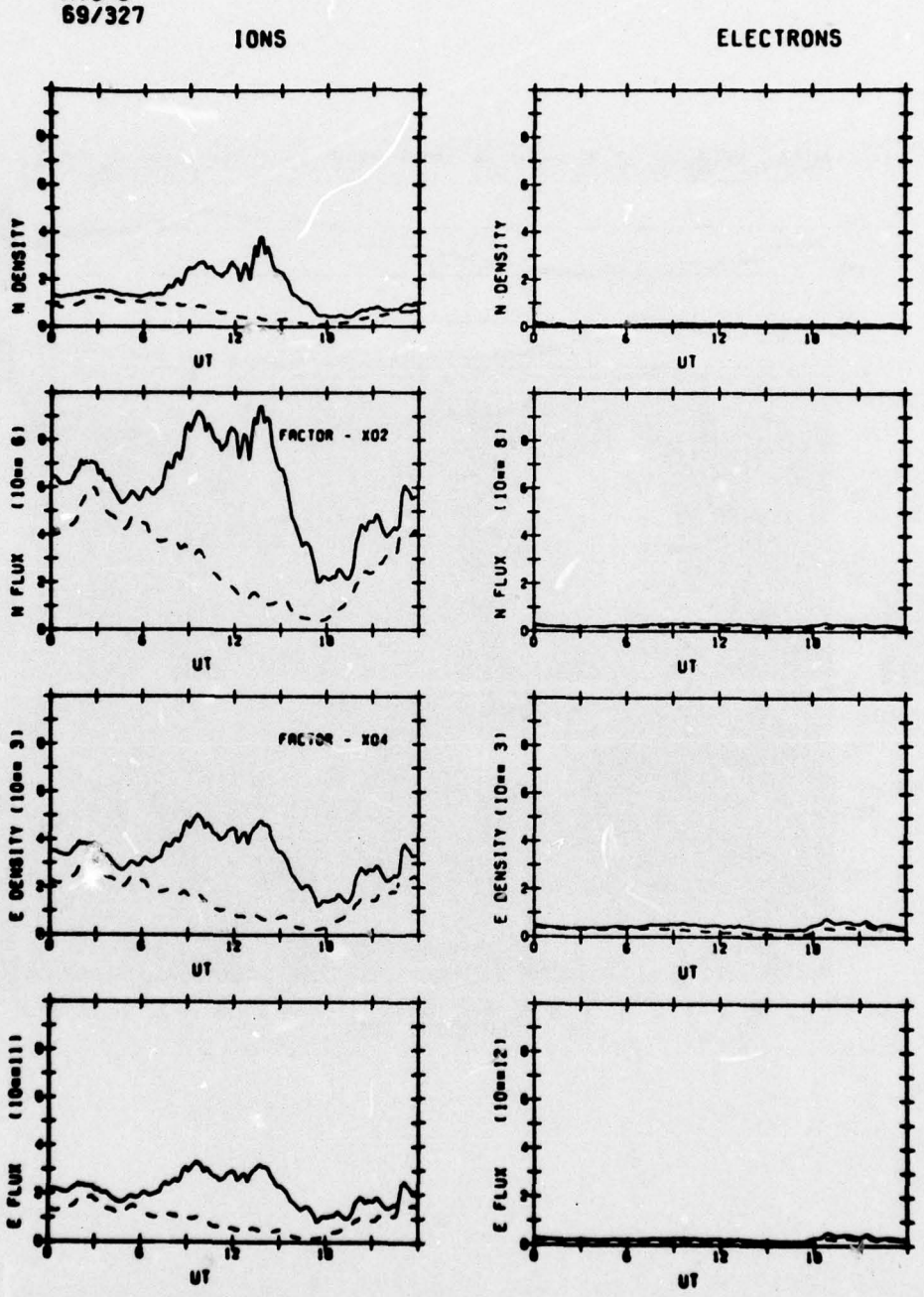
FACTOR - X02
E DENSITY (10** 3)
FACTOR - X04
E FLUX (10**11)
E FLUX (10**12)
UT
0
6
12
18


ELECTRONS
ENERGY
IN EV
11/22/88
PROTONS
ENERGY
IN EV
DAY 326 OF 1988

ATS-5
69/327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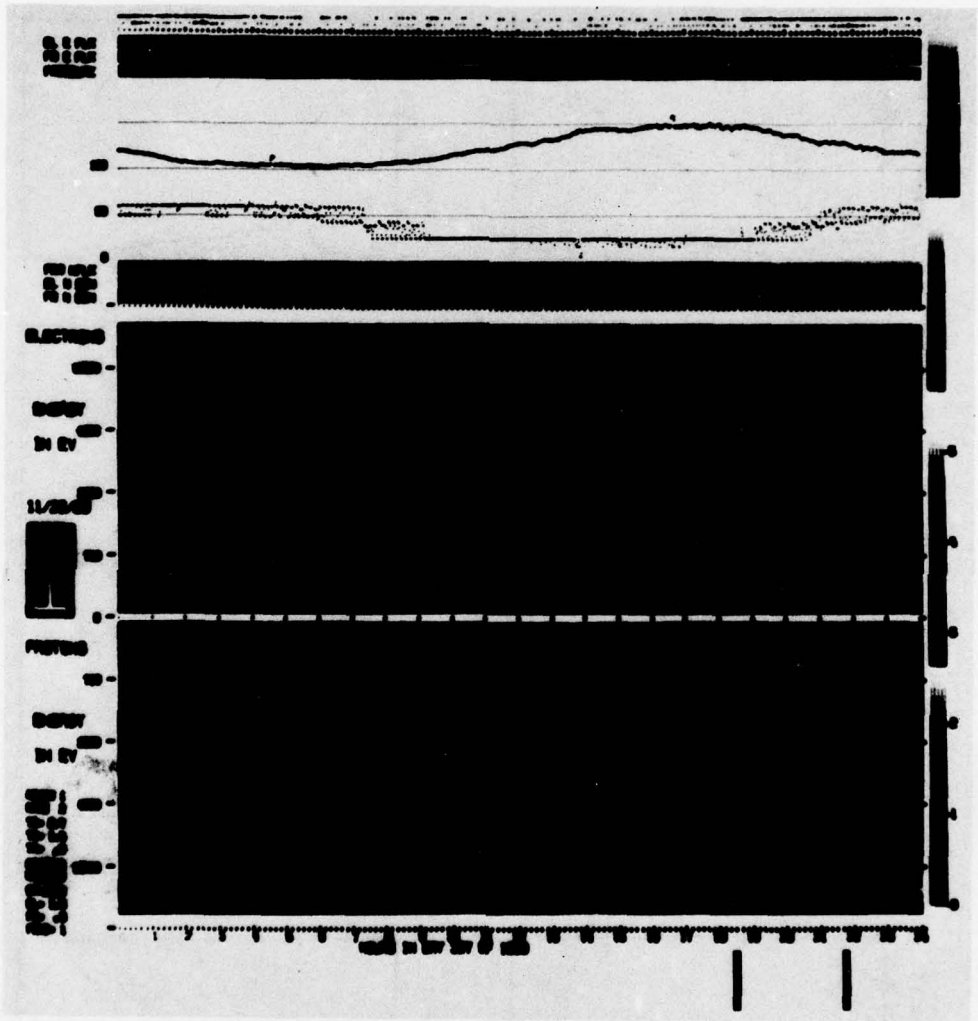
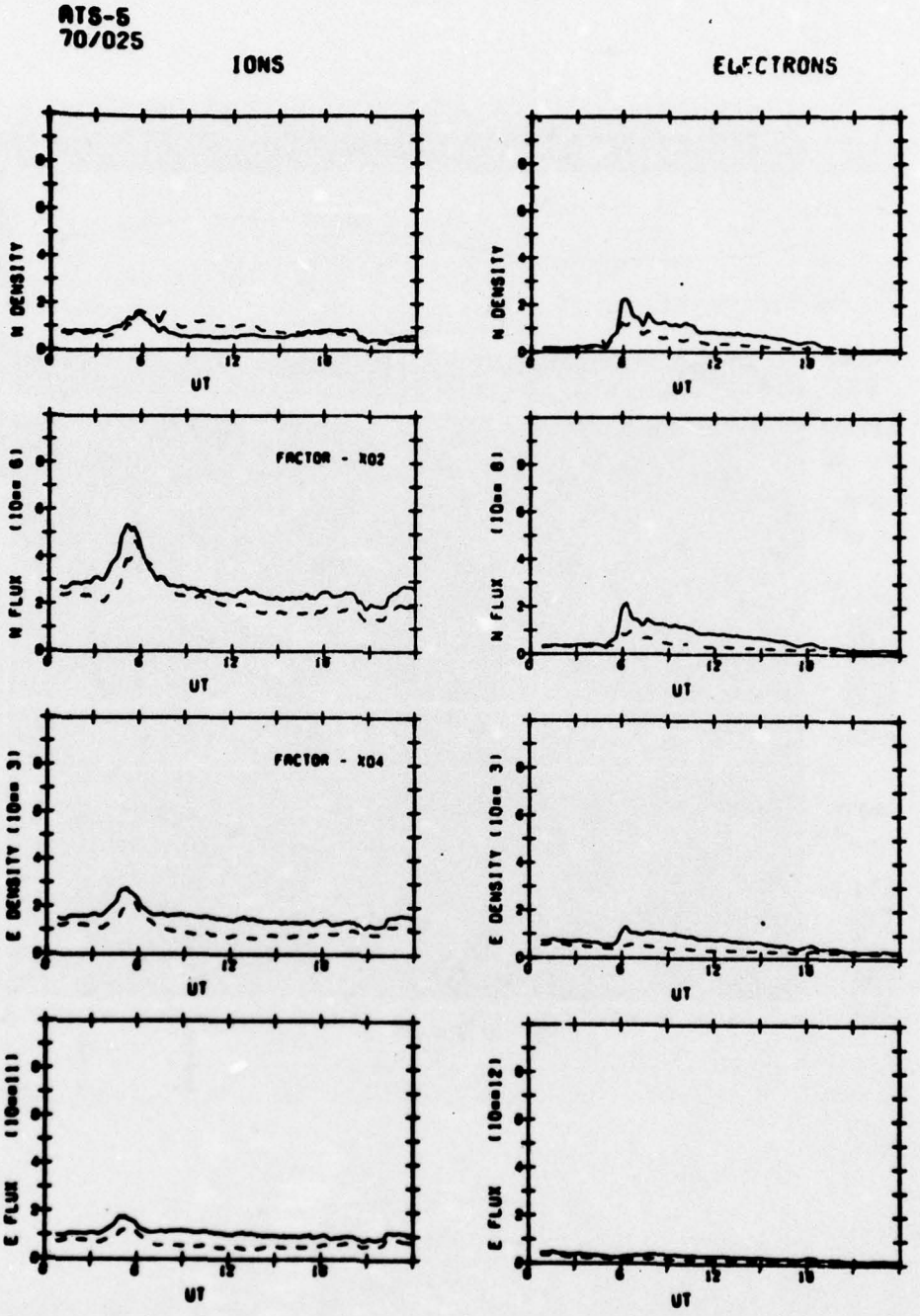
FACTOR - X02
E DENSITY (10** 3)
FACTOR - X04
E FLUX (10**11)
E FLUX (10**12)
UT
0
6
12
18
2
4
6
8




ATS-5
70/025
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UT
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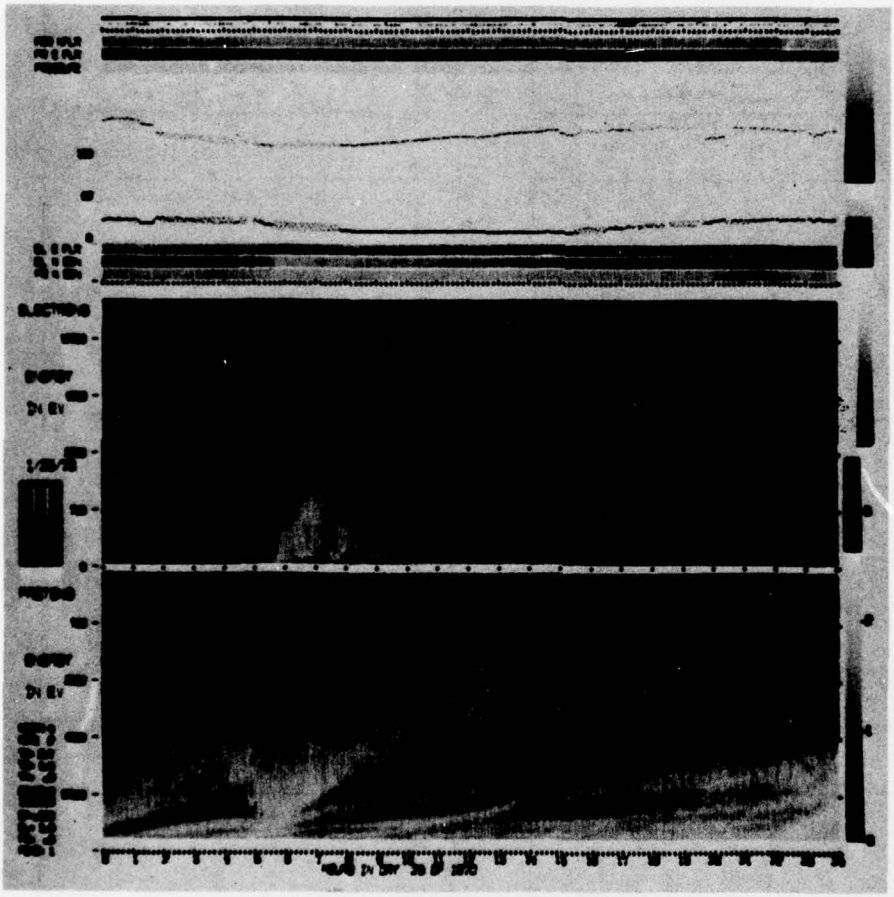
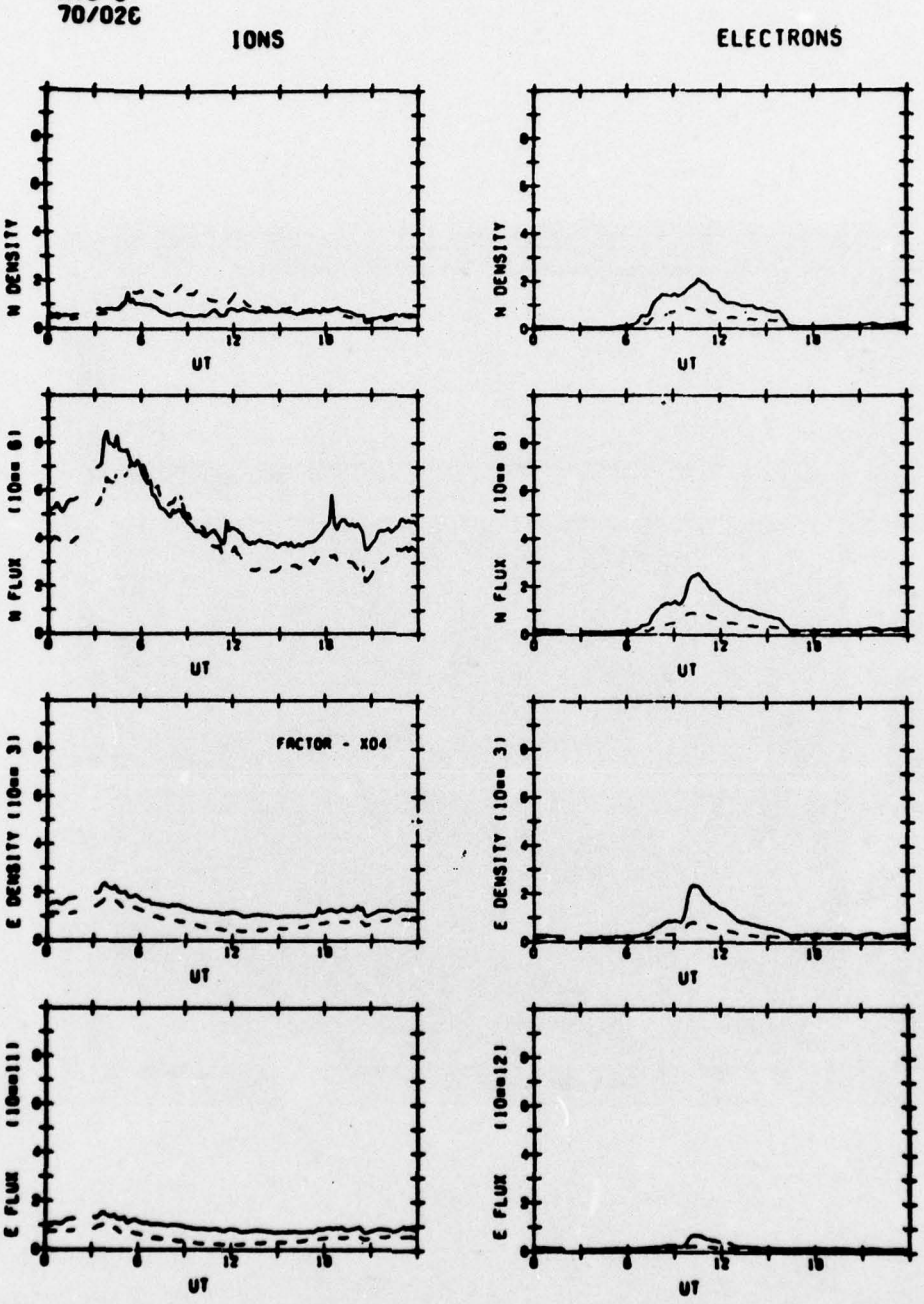
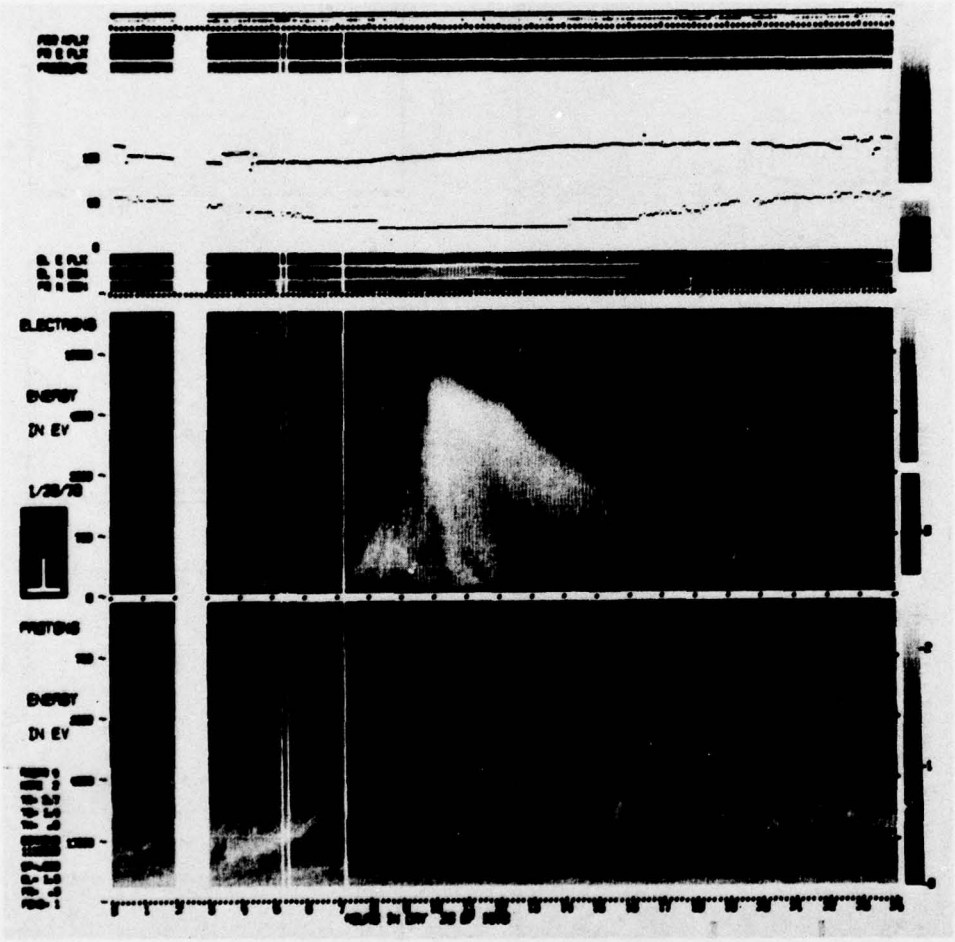
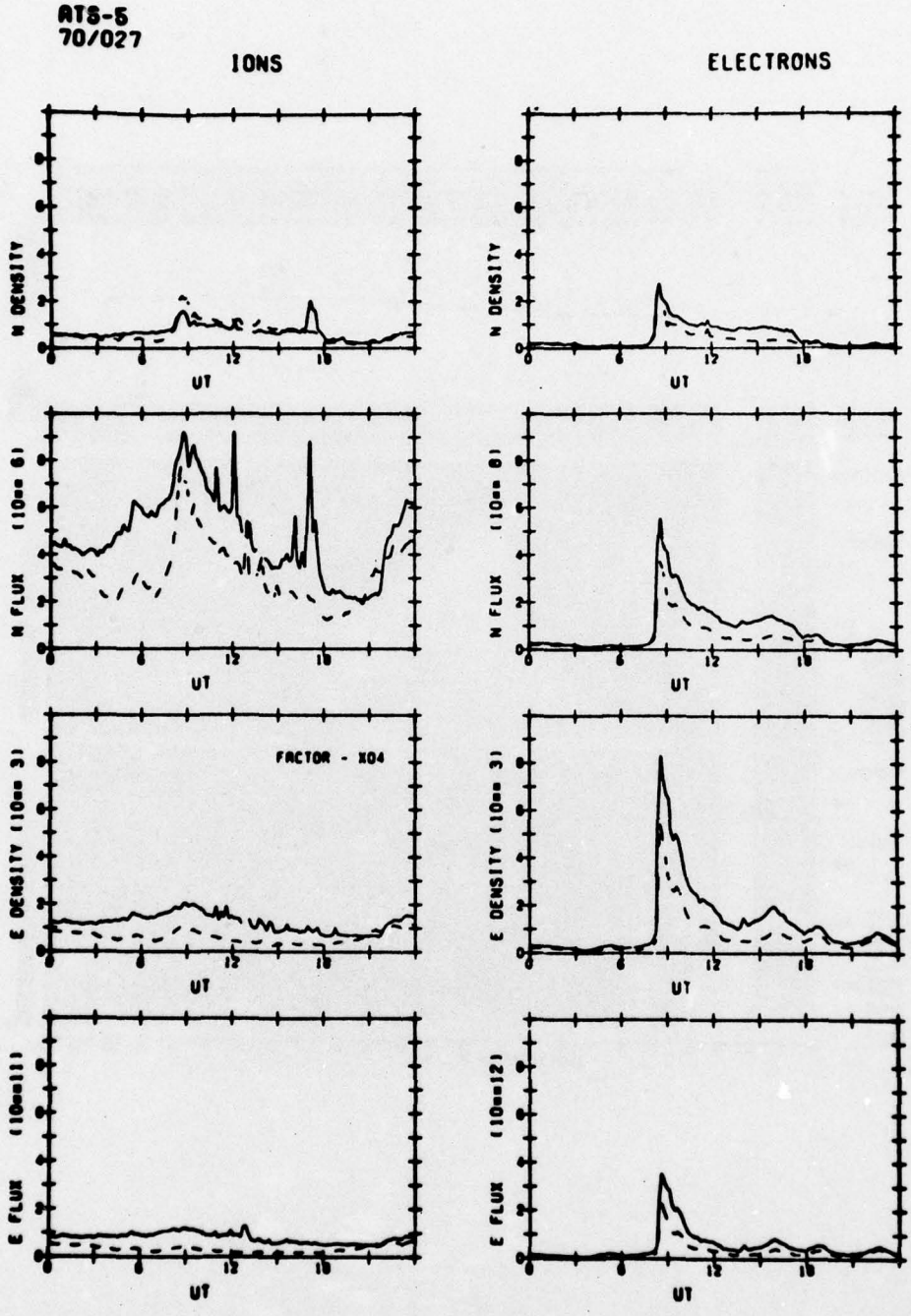
FACTOR - X02
E DENSITY (10** 3)
FACTOR - X04
E FLUX (10**11)
E FLUX (10**12)
0
6
12
18



ATS-5
70/02C


IONS
ELECTRONS
N DENSITY
N FLUX (10ⁿ 8)
E DENSITY (10ⁿ 3)
FACTOR - X04
E FLUX (10ⁿ11)
E FLUX (10ⁿ12)
UT
0
12
18


ELECTRONS
ENERGY
IN EV
PROTONS
ENERGY
IN EV


ATS-5
70/027
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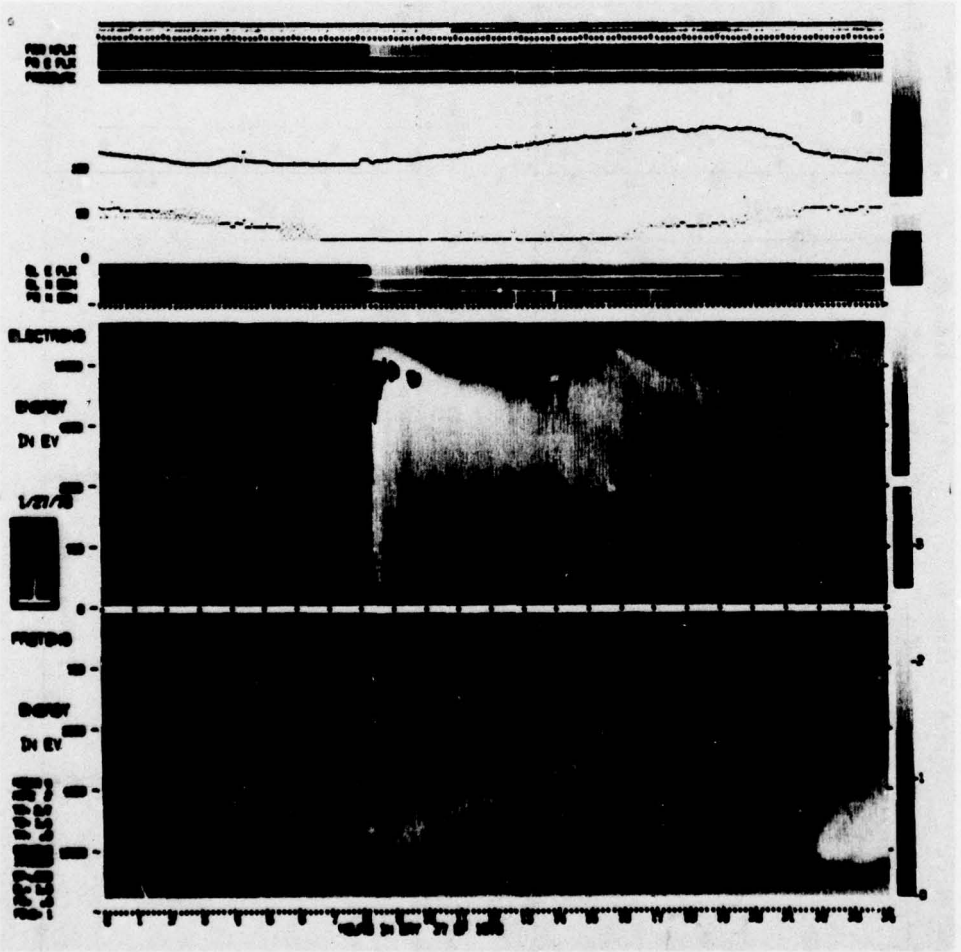
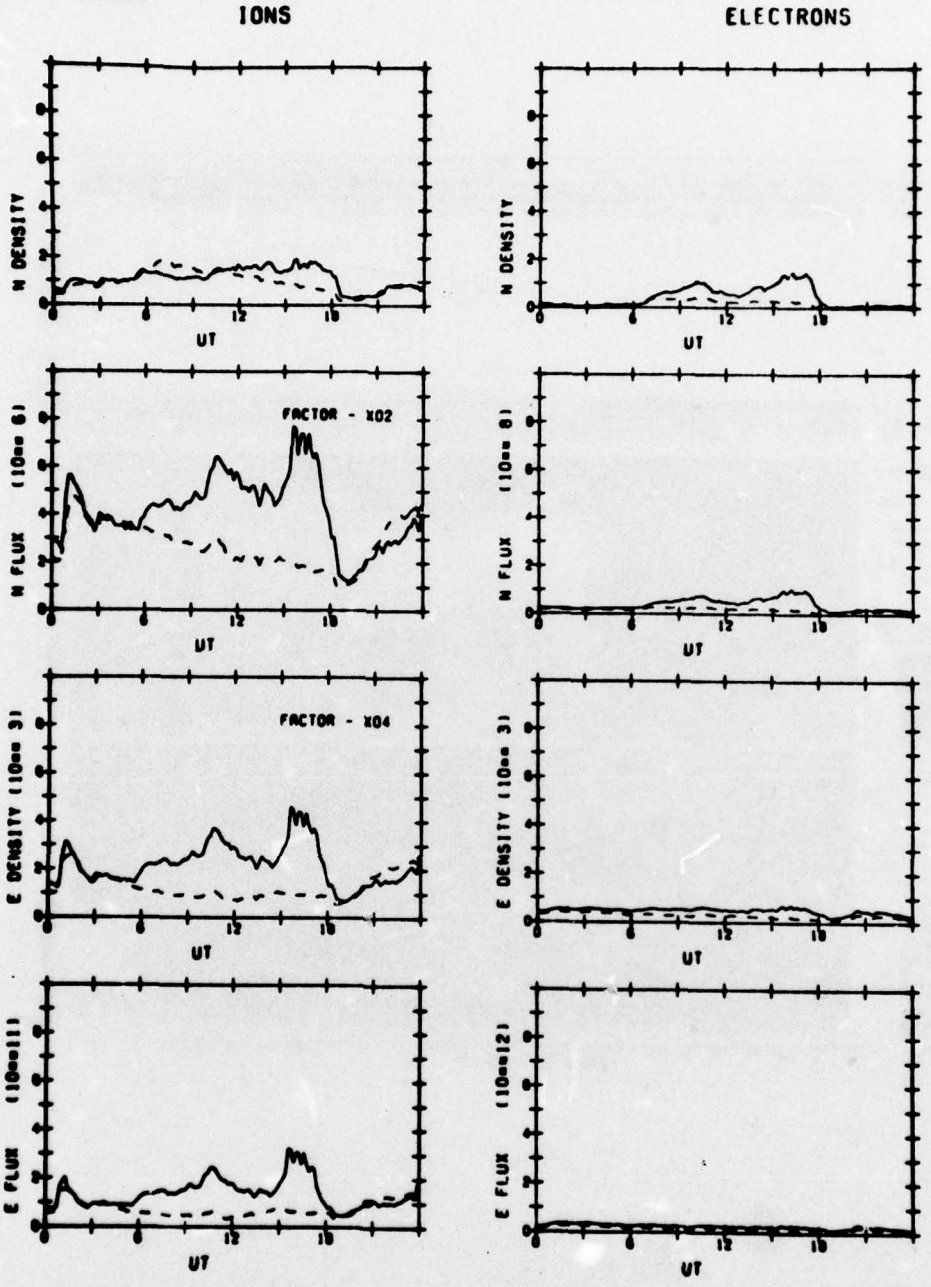
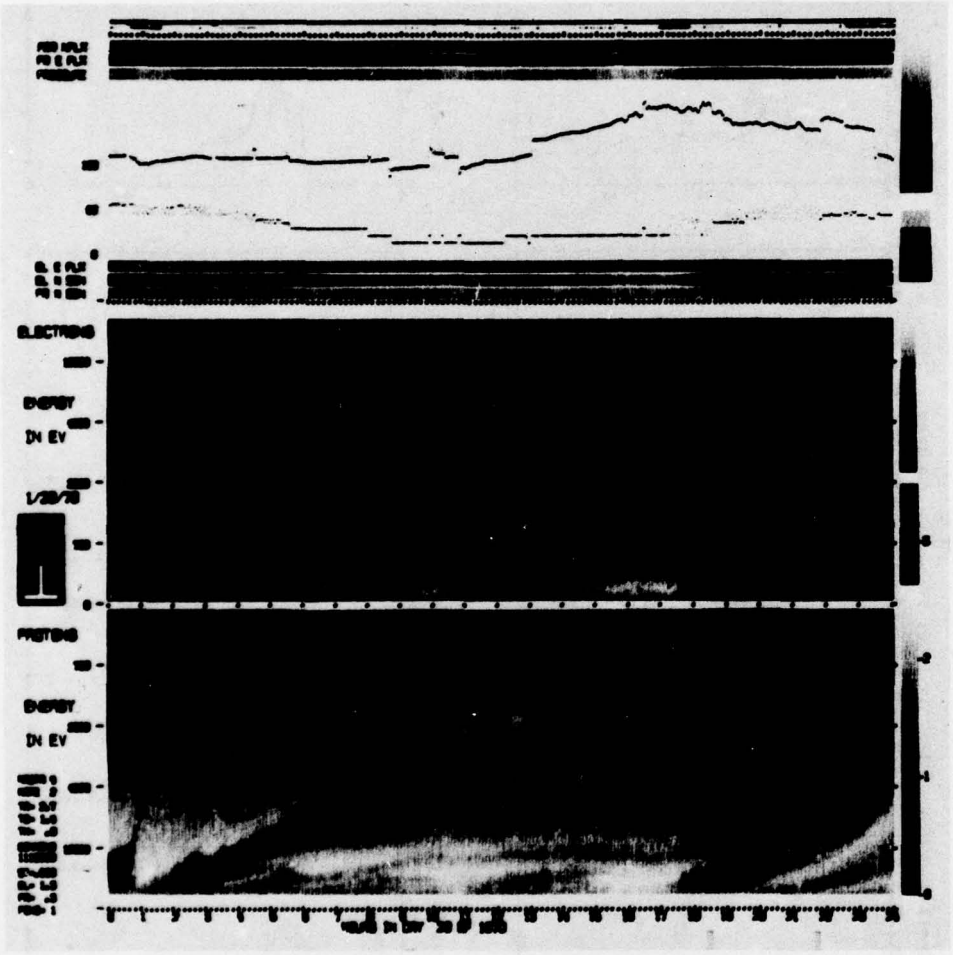
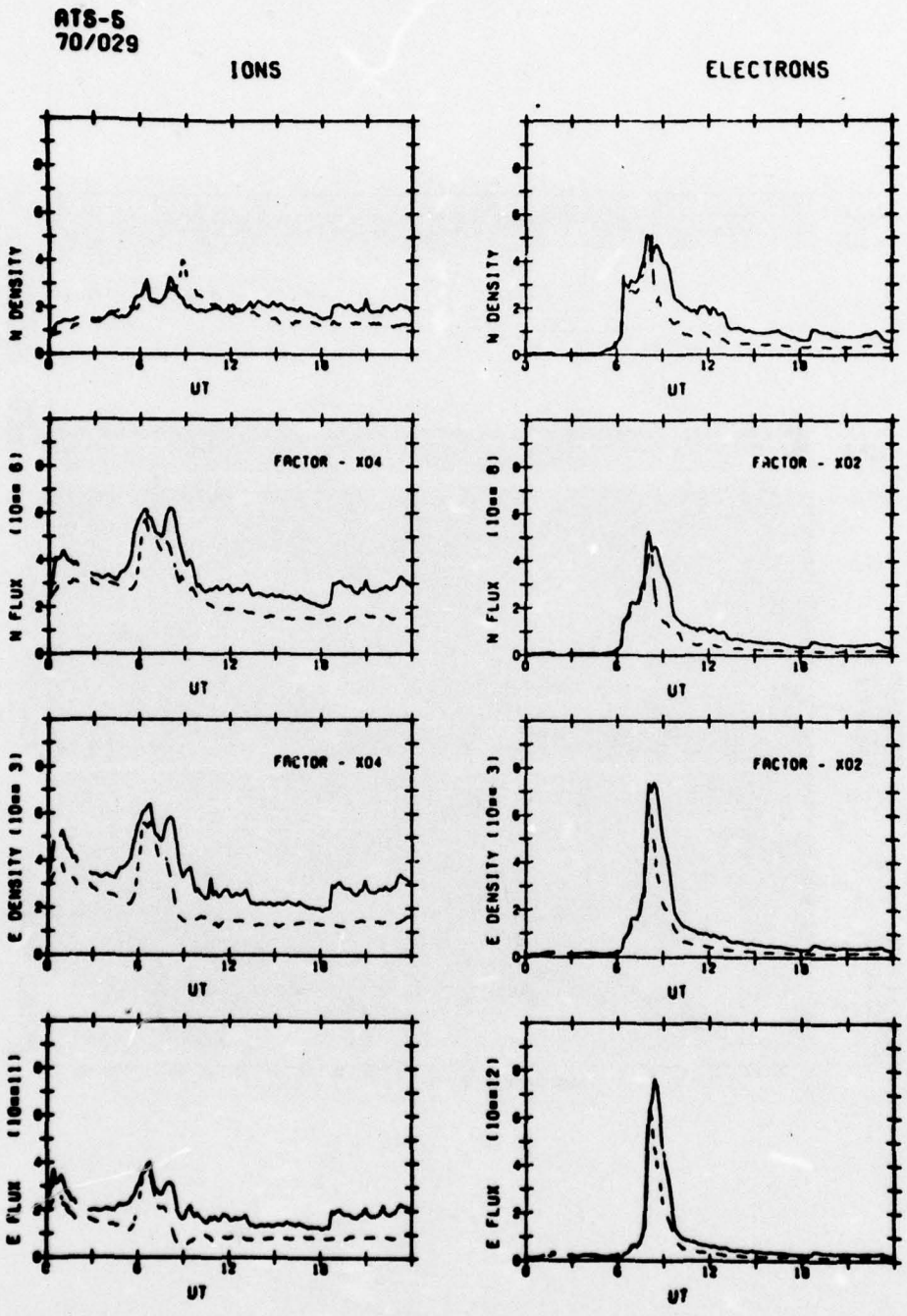
E DENSITY (10** 3)
FACTOR - X04
E FLUX (10**11)
E FLUX (10**12)
UT
0
6
12
18

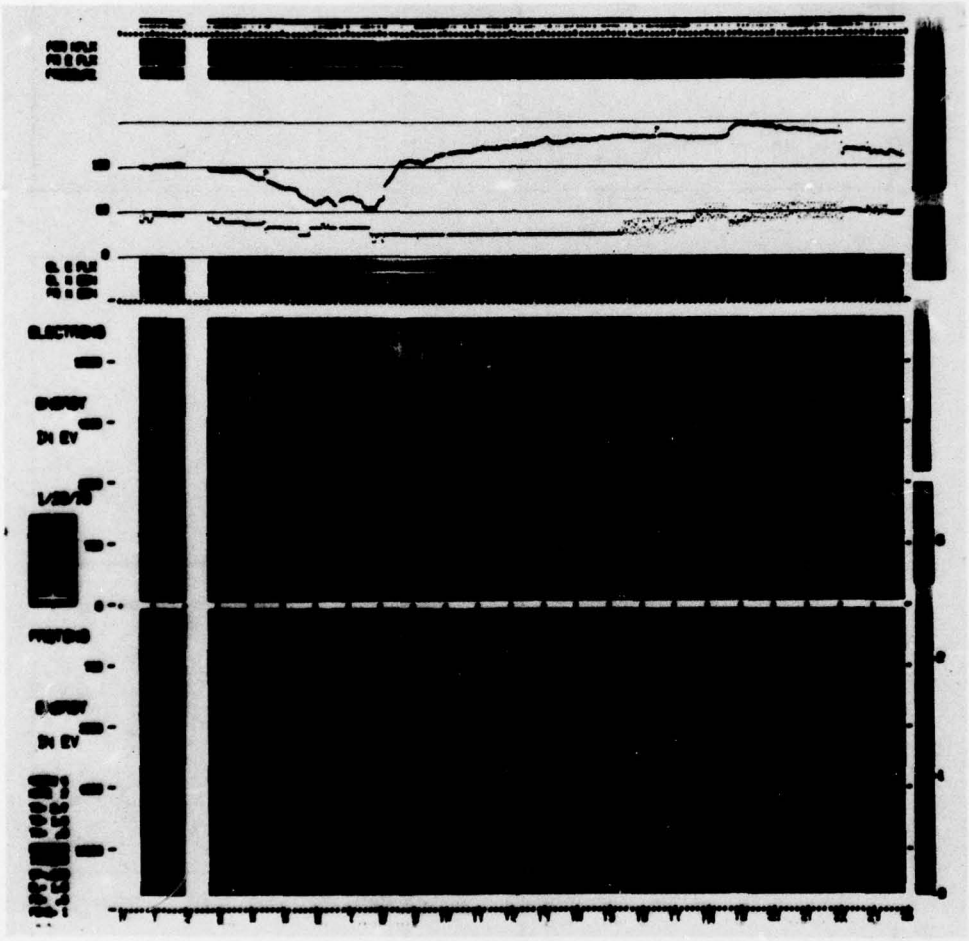


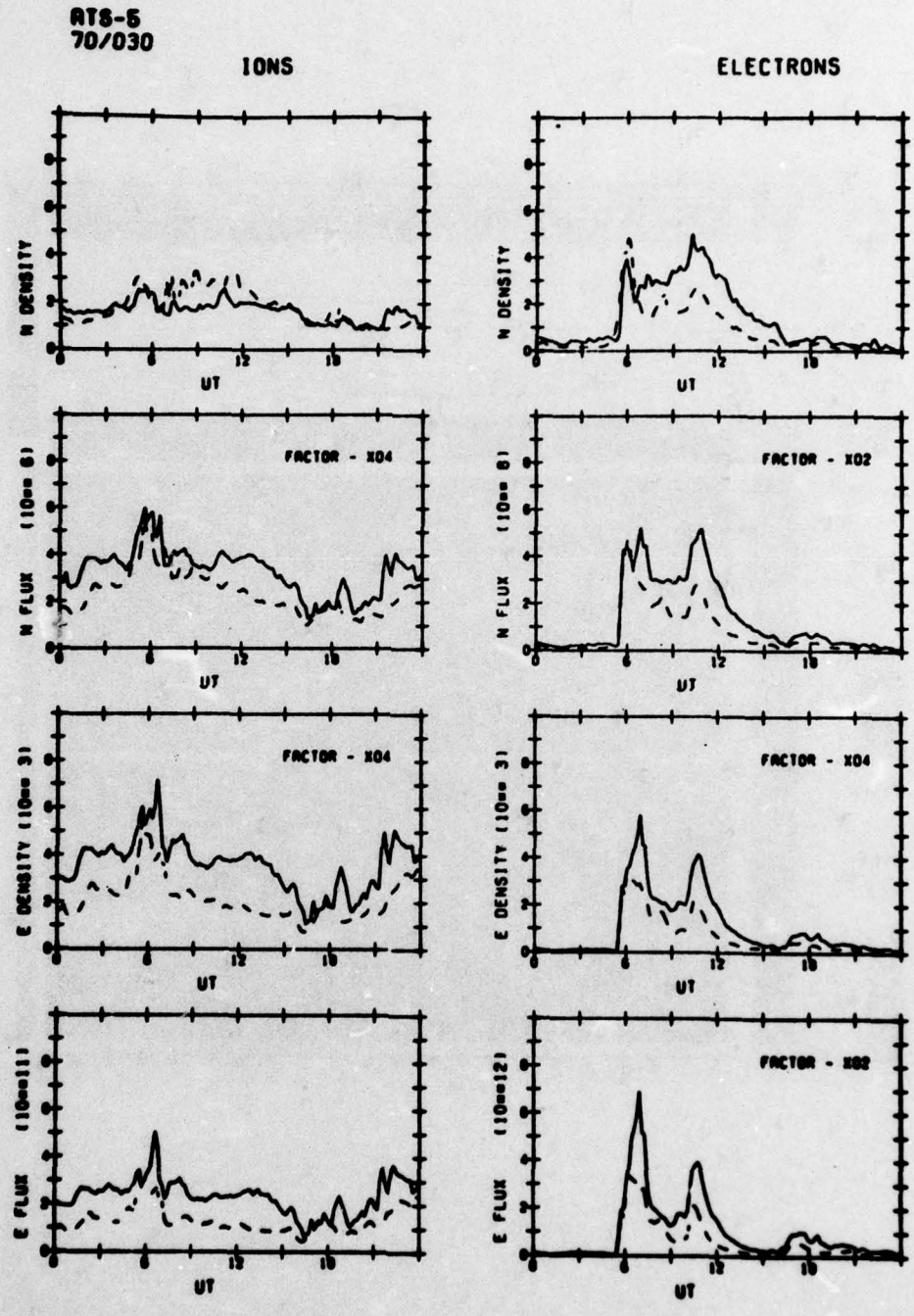
ATS-5
70/028

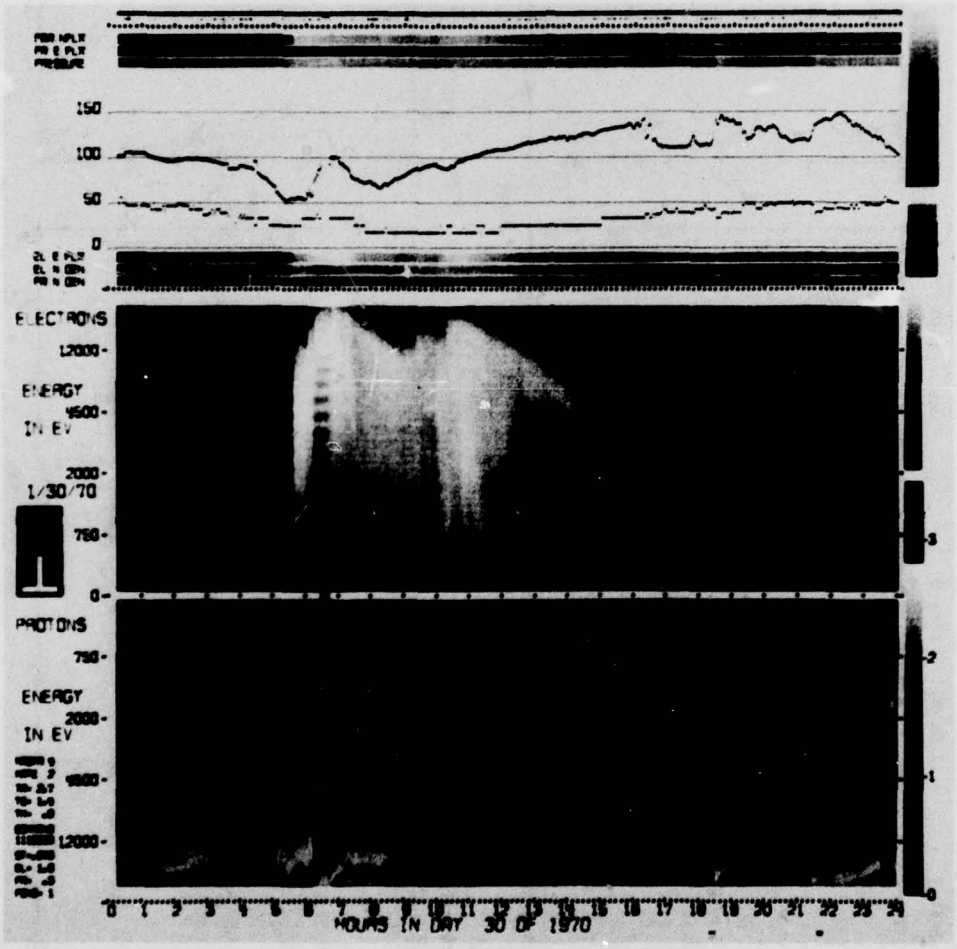

IONS
ELECTRONS
N DENSITY
UT
N FLUX (10ⁿ 6)
FACTOR - X02
N FLUX (10ⁿ 8)
E DENSITY (10ⁿ 3)
FACTOR - X04
E FLUX (10ⁿ11)
E FLUX (10ⁿ12)
0
6
12
18




ATS-5
70/029
IONS
ELECTRONS
N DENSITY
UT
N FLUX (10** 6)
FACTOR - X04
FACTOR - X02
E DENSITY (10** 3)
E FLUX (10**12)
0
6
12
18




ATS-5
70/030
IONS
ELECTRONS
N DENSITY
N FLUX (10** 6)
FACTOR - X04
FACTOR - X02
E DENSITY (10** 3)
FACTOR - X04
FACTOR - X04
E FLUX (10**11)
E FLUX (10**12)
FACTOR - X02
UT
0
6
12
18


150
100
50
0
ELECTRONS
12000-
ENERGY
IN EV
4500-
2000-
1/30/70
750-
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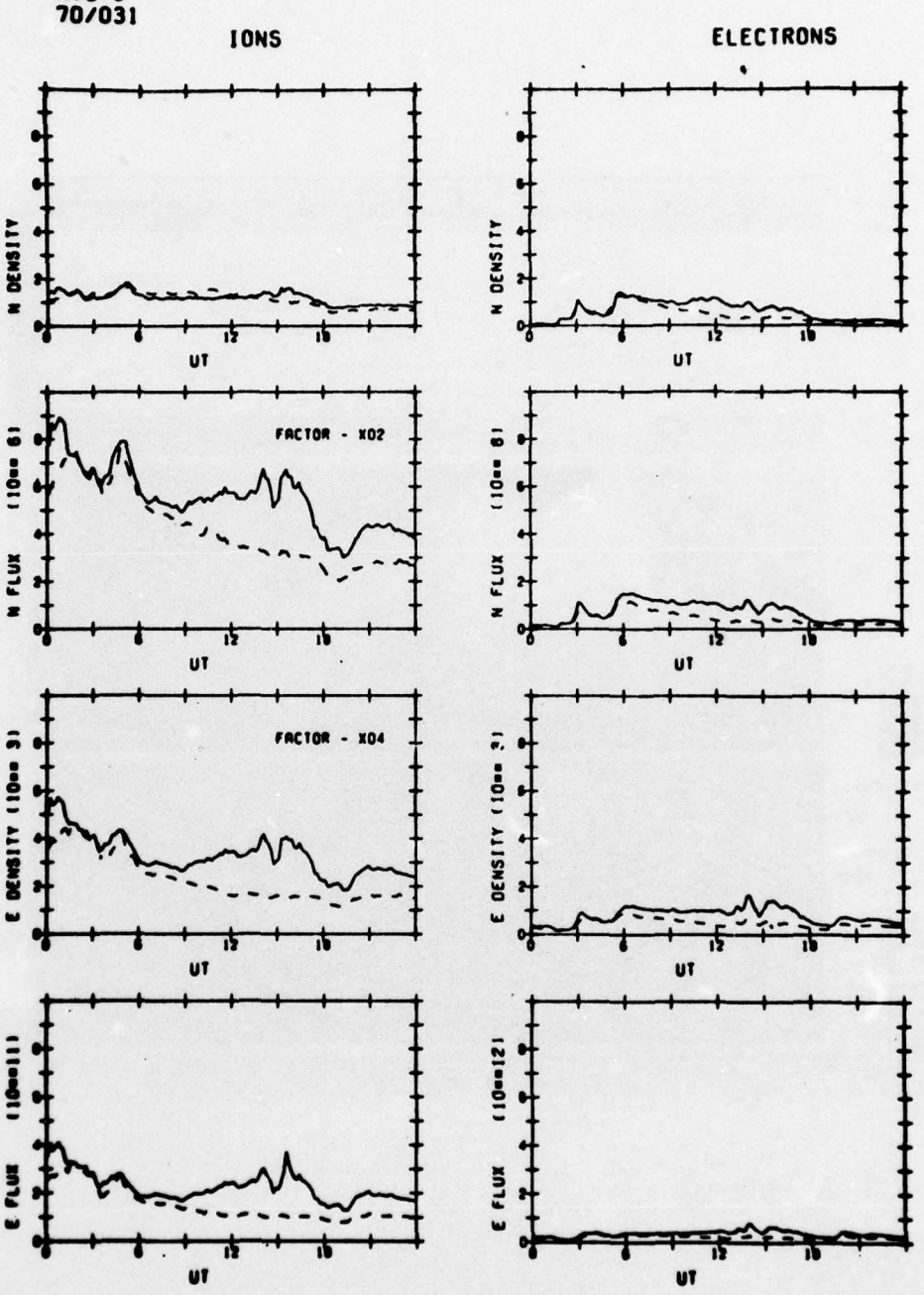
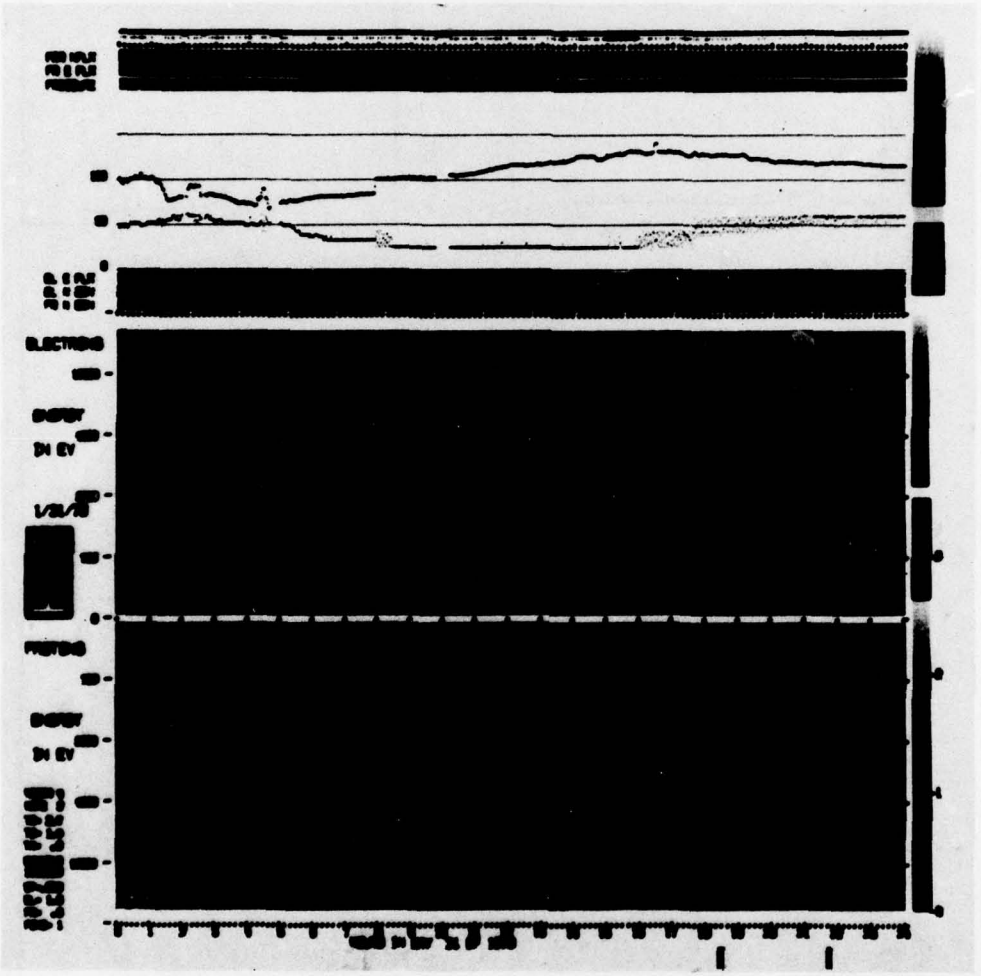
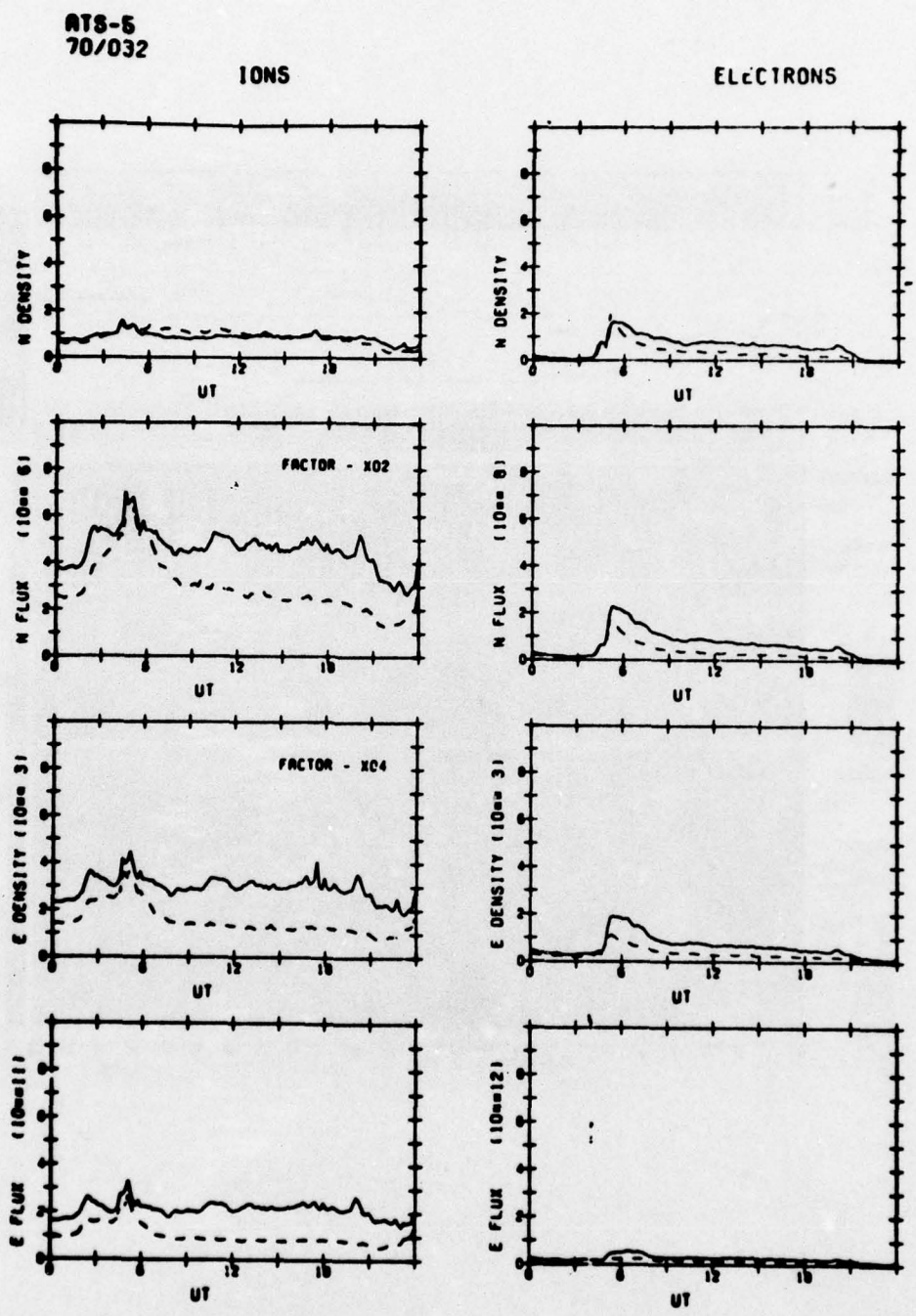
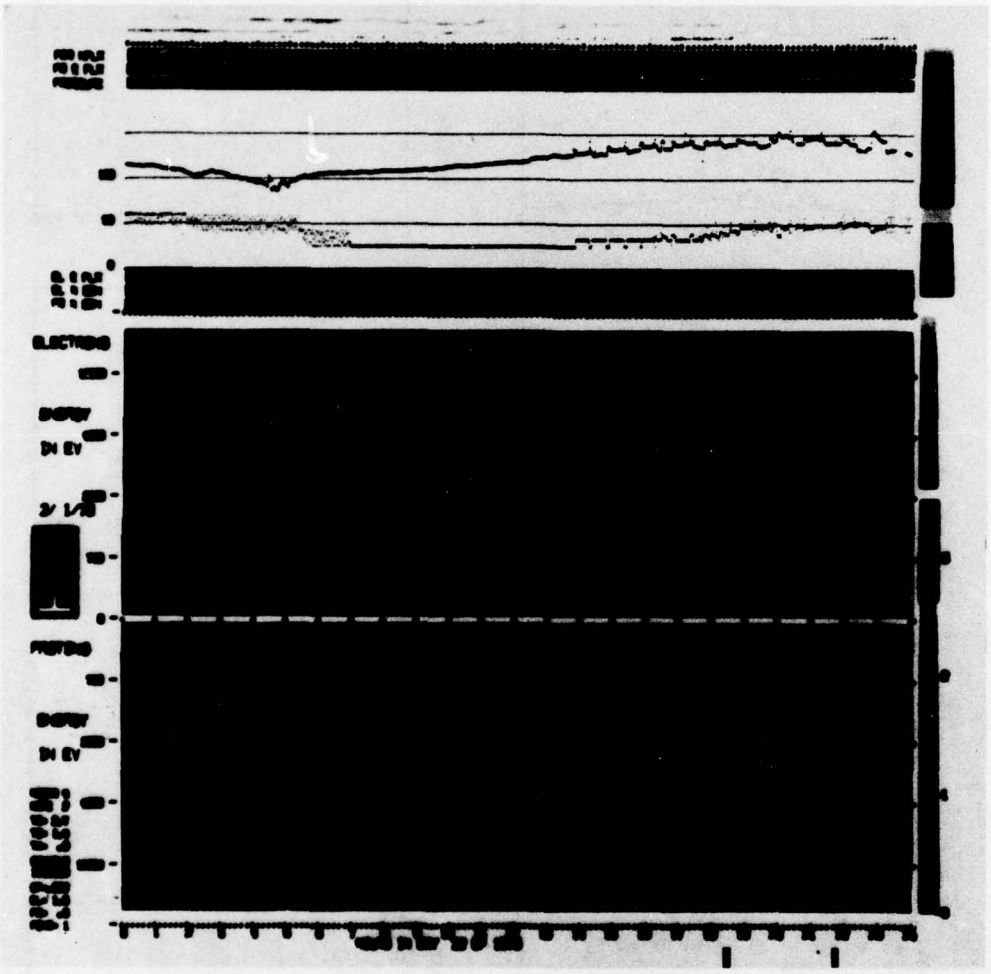
PROTONS
750-
ENERGY
2000-
IN EV
4500-
12000-
HOURS IN DAY 30 OF 1970

ATS-5
70/031


IONS
ELECTRONS
N DENSITY
N FLUX (10** 6)
FACTOR - X02
E DENSITY (10** 3)
FACTOR - X04
E FLUX (10**11)
E FLUX (10**12)
UT
0
6
12
18




ATS-5
70/032
IONS
ELECTRONS
N DENSITY
N FLUX (10** 6)
FACTOR - X02
E DENSITY (10** 3)
FACTOR - X04
E FLUX (10**11)
E FLUX (10**12)
UT
0
6
12
18



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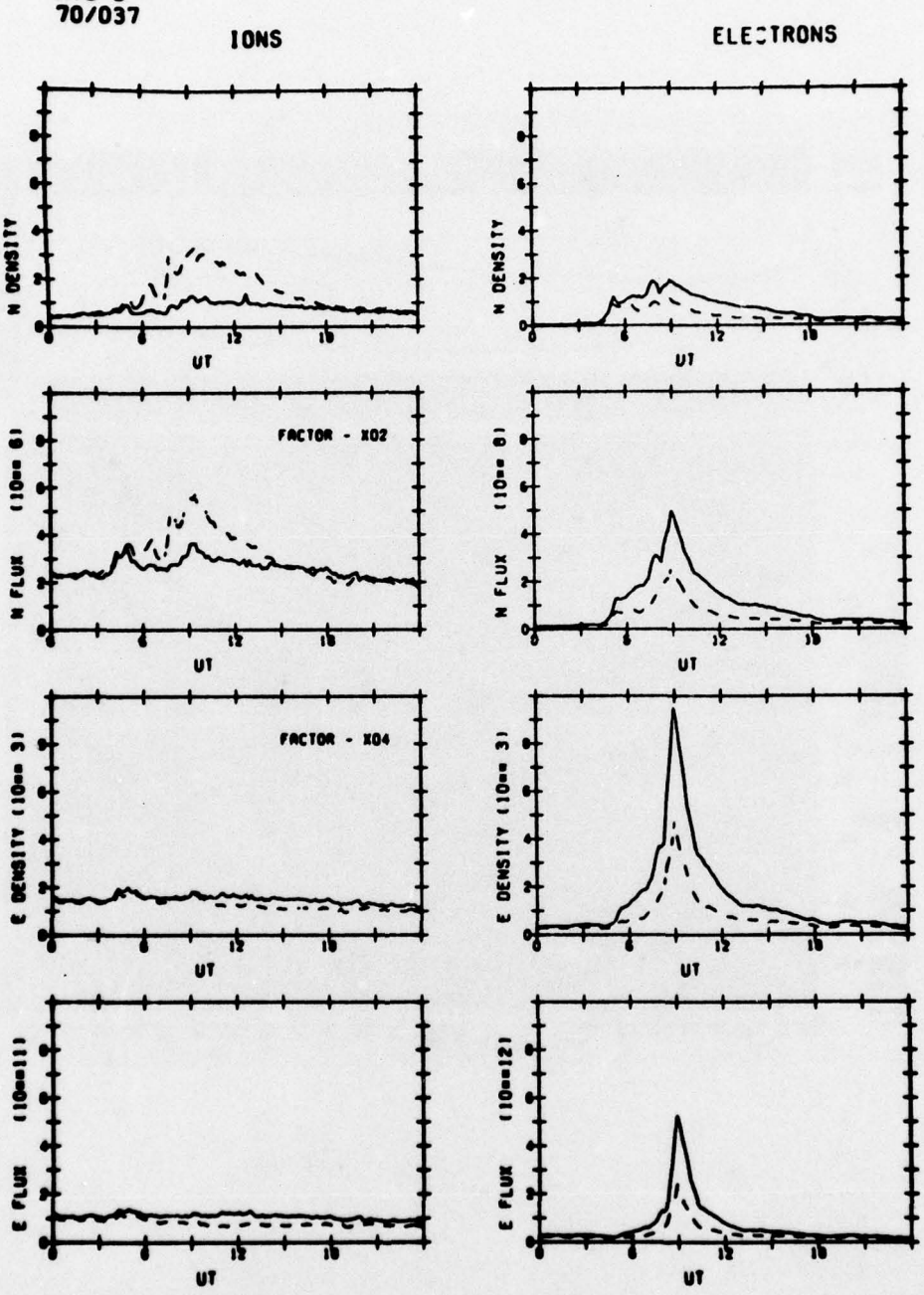
70/037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ELECTRONS
N DENSITY
N FLUX (10** 8)
FACTOR - X02
E DENSITY (10** 3)
FACTOR - X04
E FLUX (10**11)
E FLUX (10**12)
UT
0
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12
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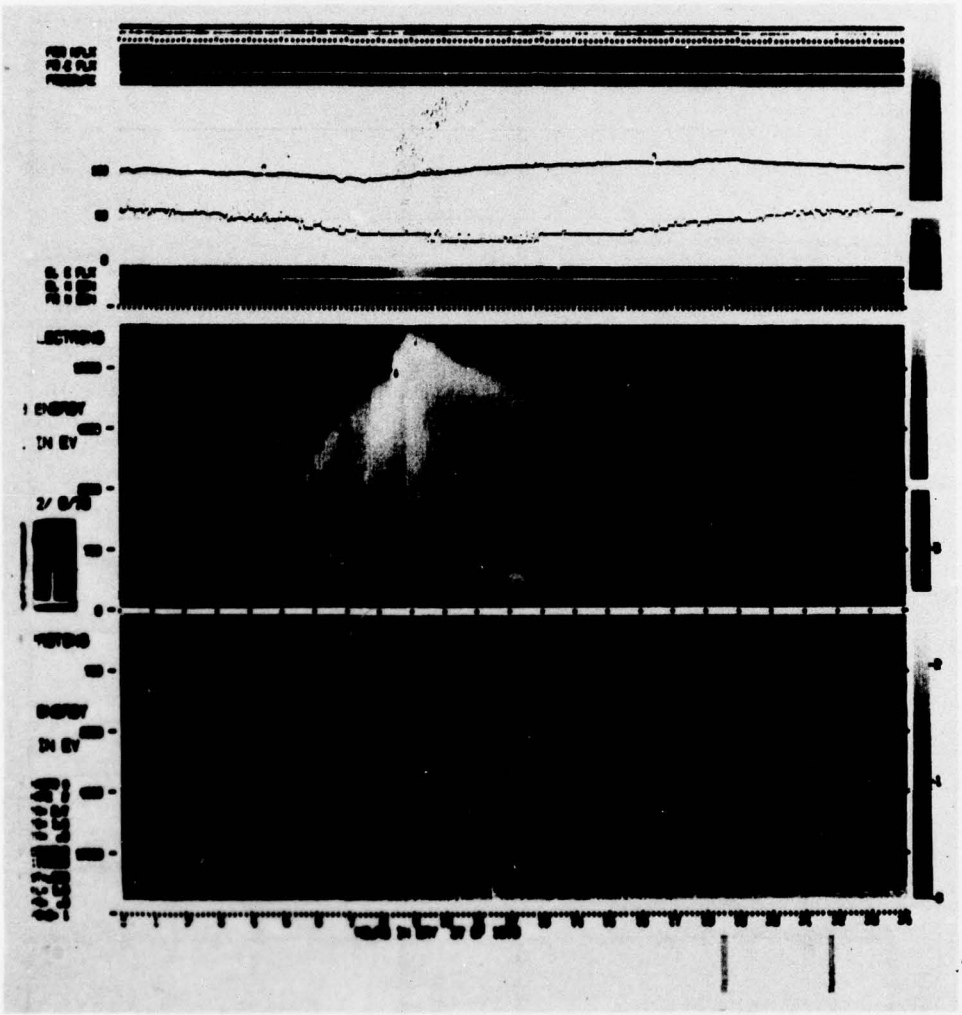

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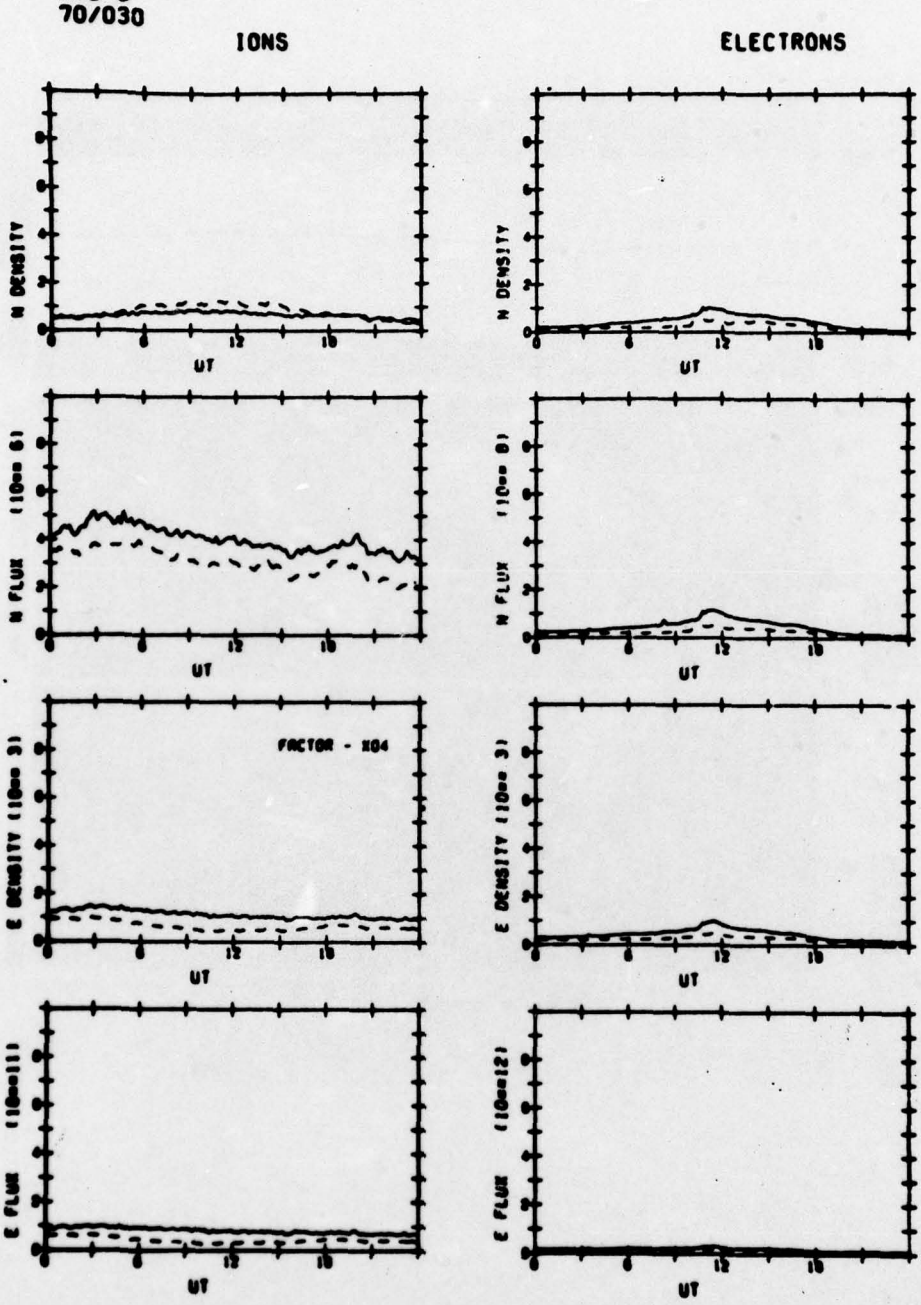
70/030


IONS
ELECTRONS
N DENSITY
N FLUX (10cm S)
E DENSITY (10cm 3)
FACTOR - X04
E FLUX (10cm12)
UT
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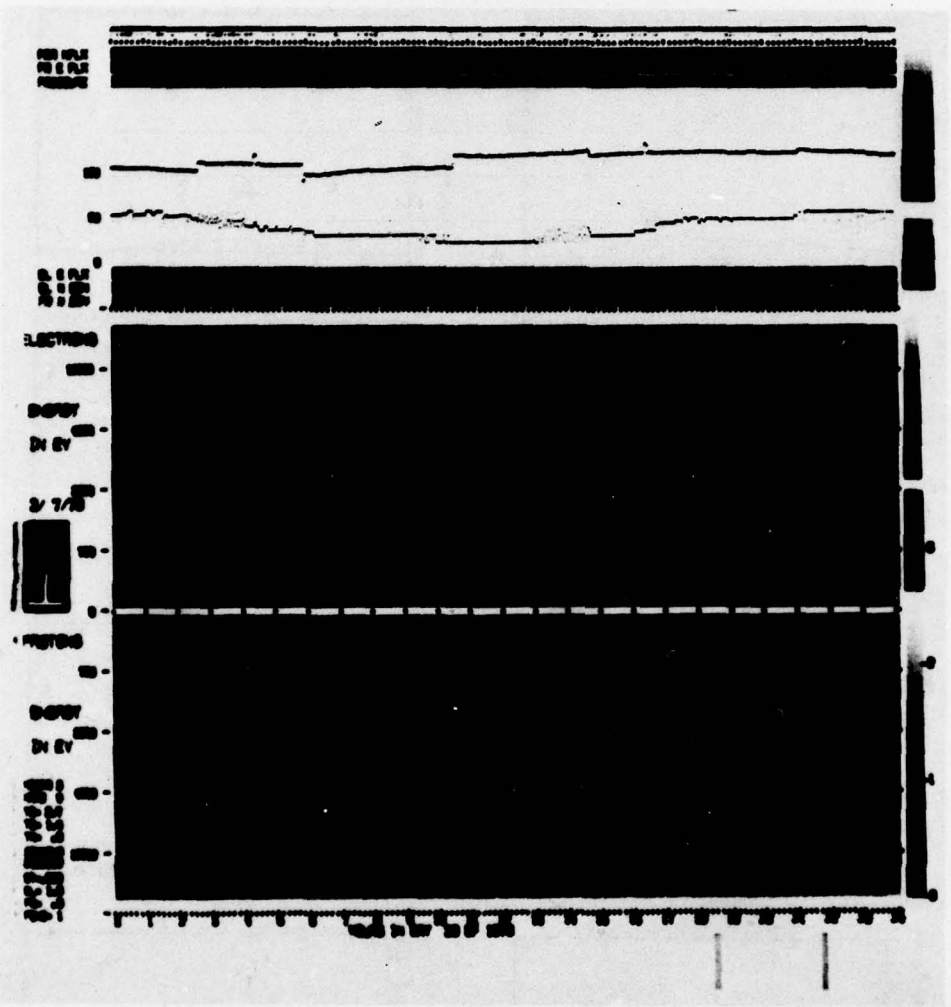
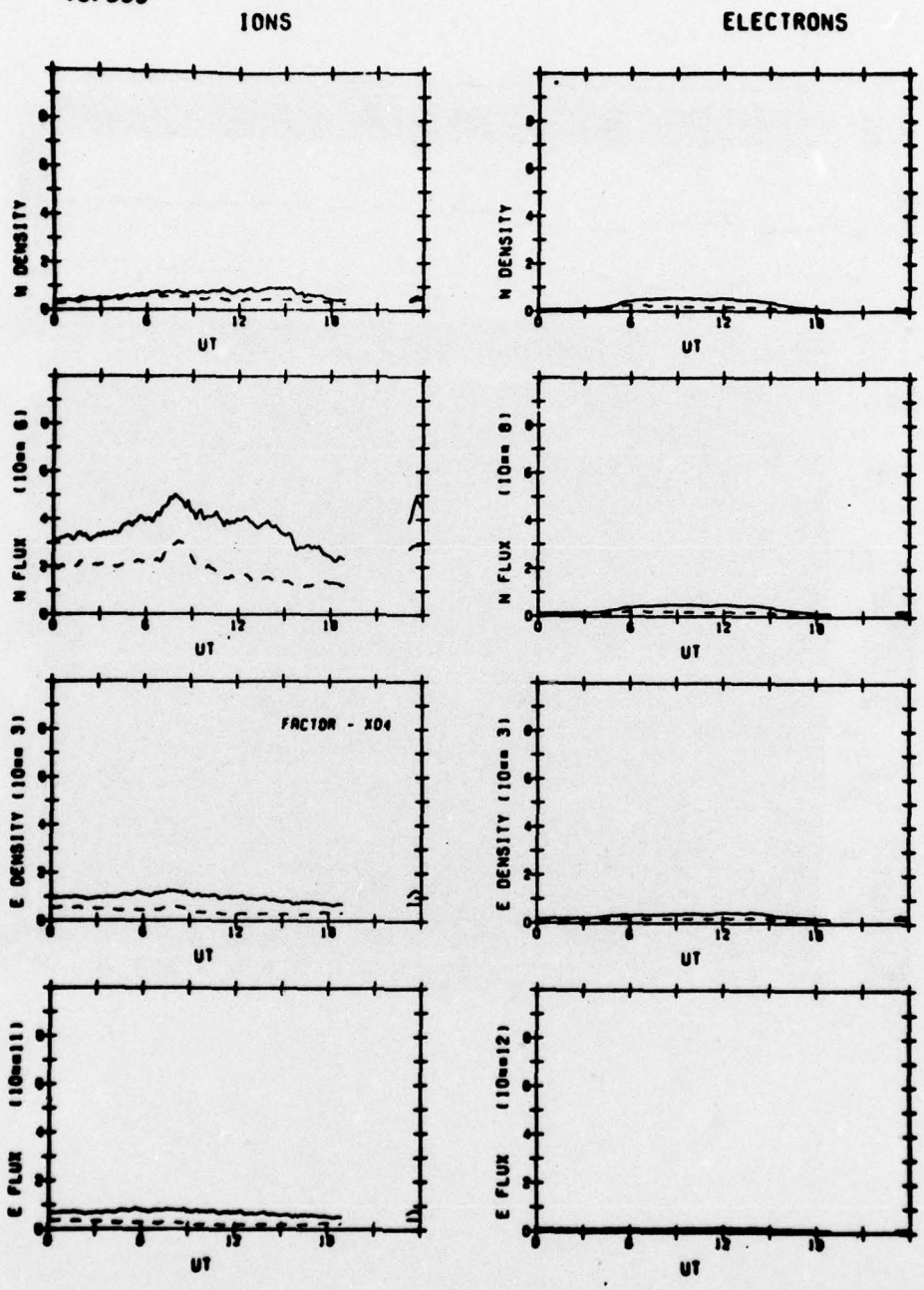
6
12
18



ATS-5
70/039


IONS
ELECTRONS
N DENSITY
N FLUX (10** 6)
E DENSITY (10** 3)
FACTOR - X04
E FLUX (10**11)
E FLUX (10**12)
UT
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6
12
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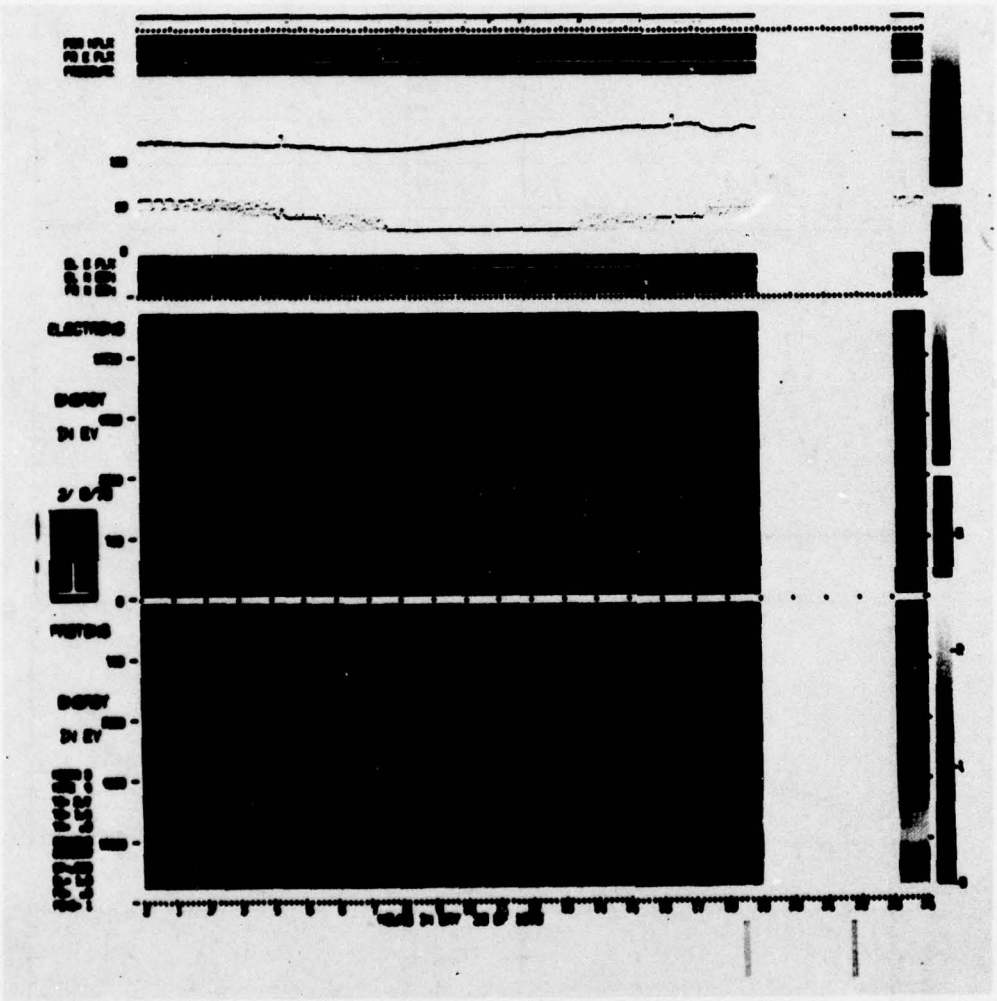
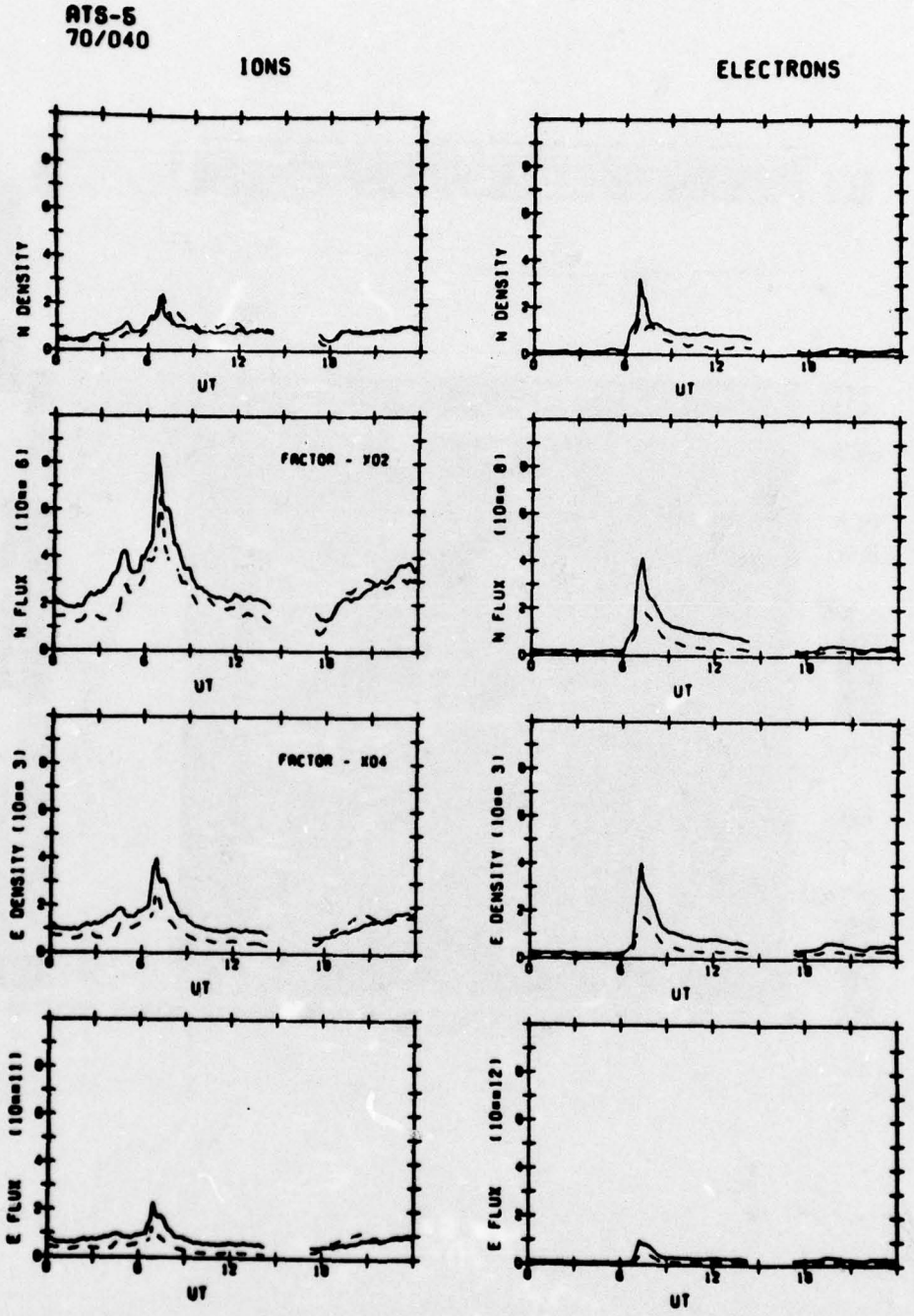
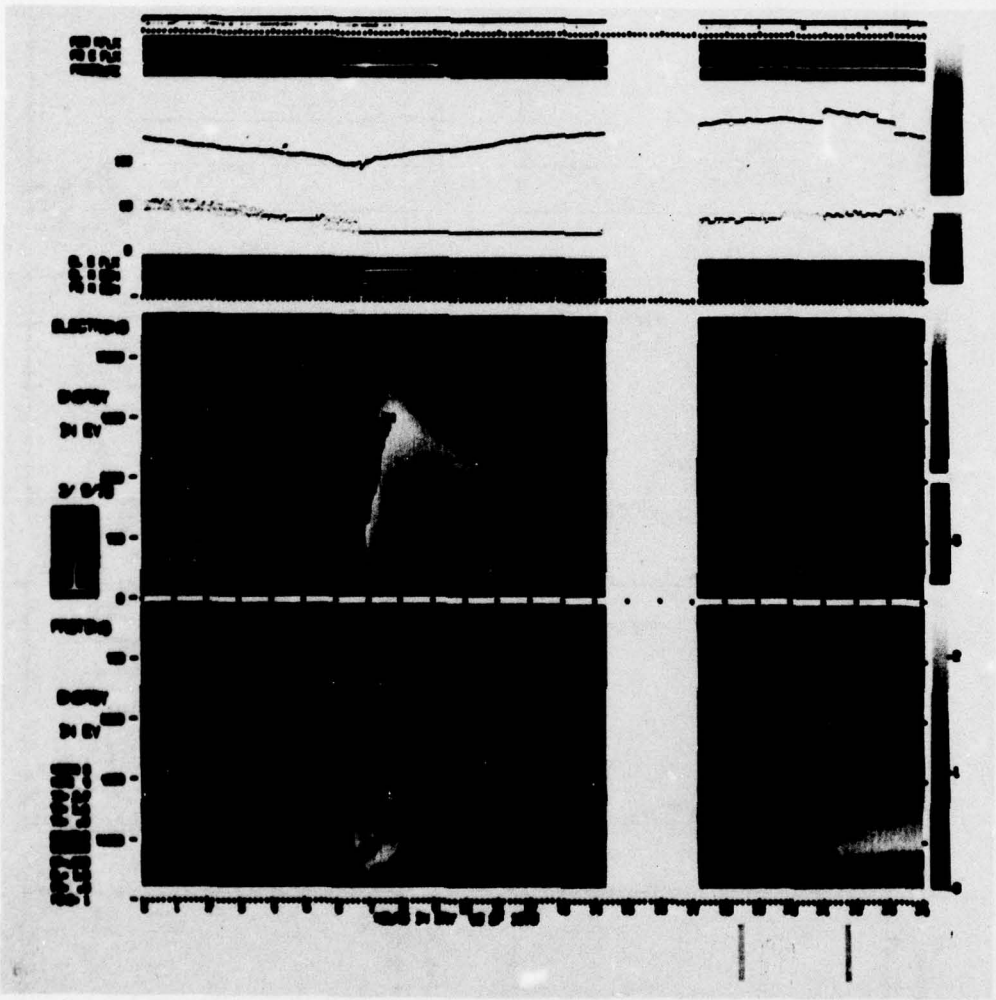
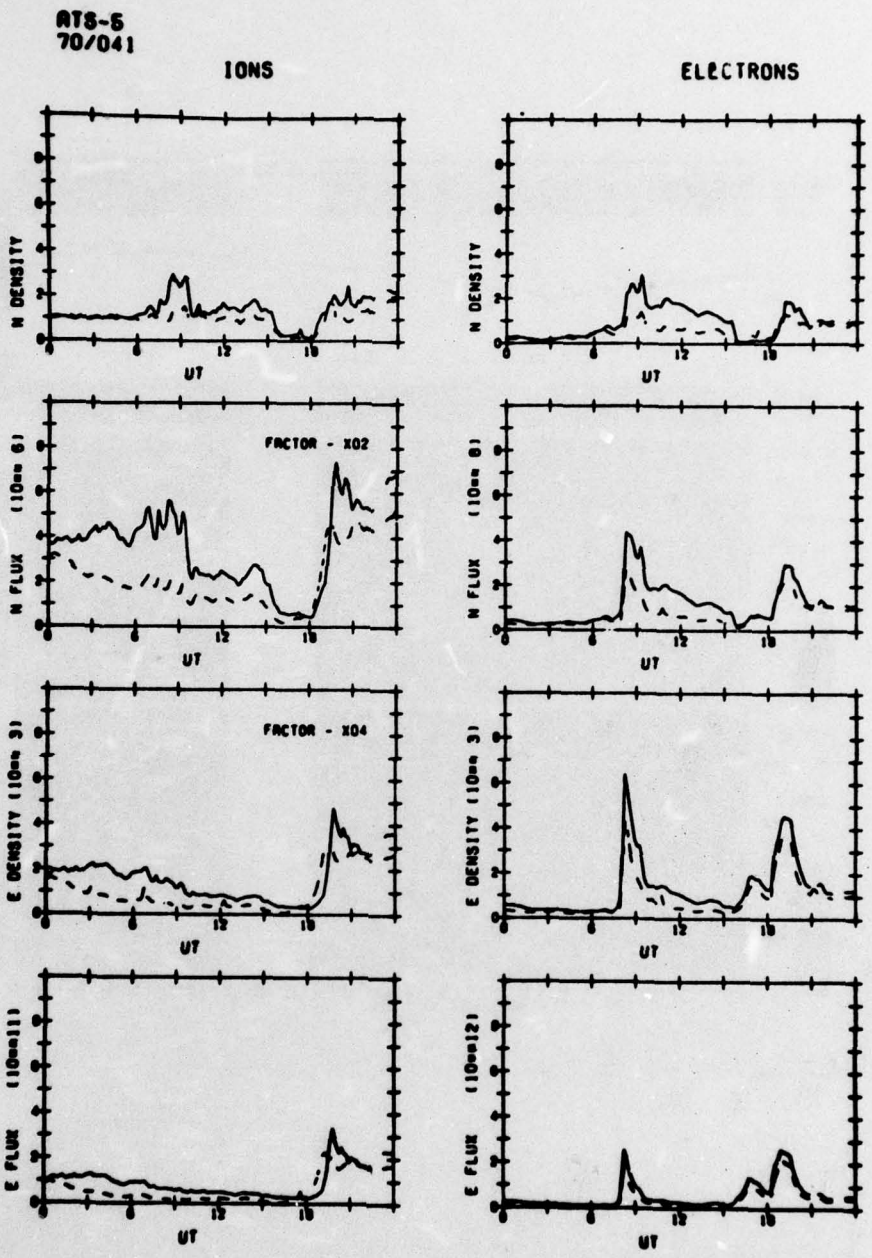
2
4
6
8




ATS-5
70/040
IONS
ELECTRONS
N DENSITY
N FLUX (10** 6)
FACTOR - X02
E DENSITY (10** 3)
FACTOR - X04
E FLUX (10**11)
E FLUX (10**12)
UT
0
6
12
18




ATS-5
70/041
IONS
ELECTRONS
N DENSITY
N FLUX (10cm 6)
FACTOR - X02
E DENSITY (10cm 3)
FACTOR - X04
E FLUX (10cm11)
E FLUX (10cm12)
UT
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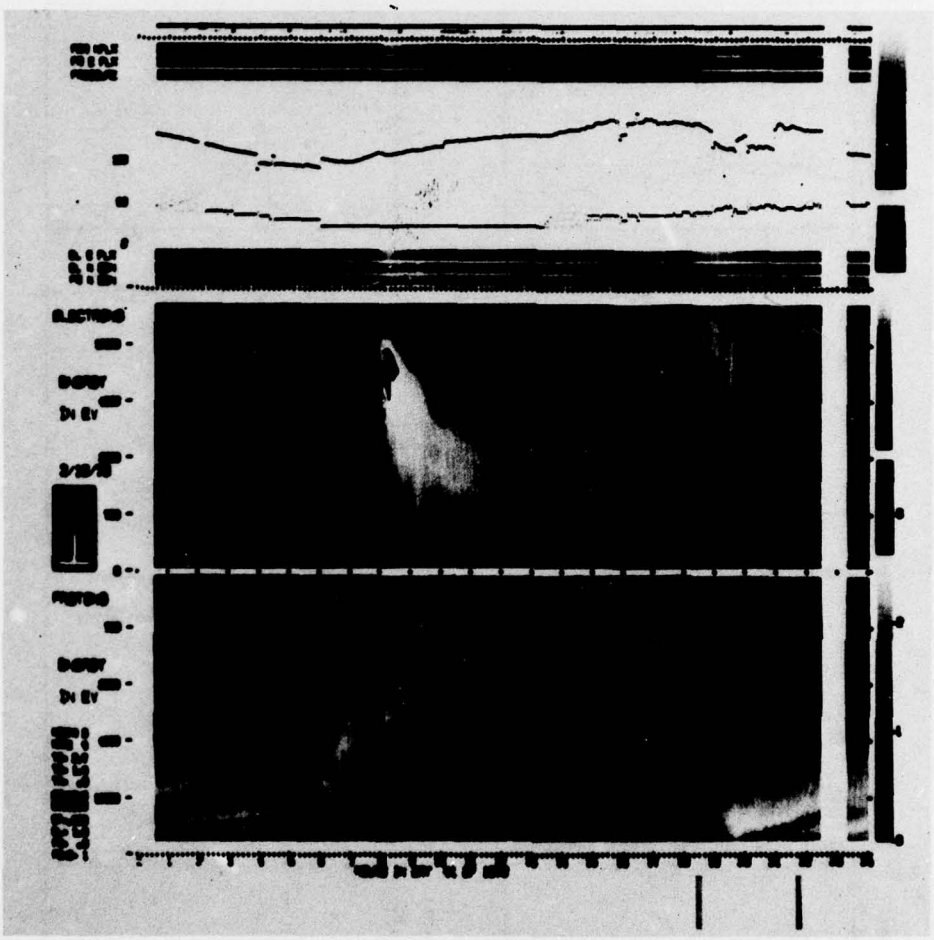
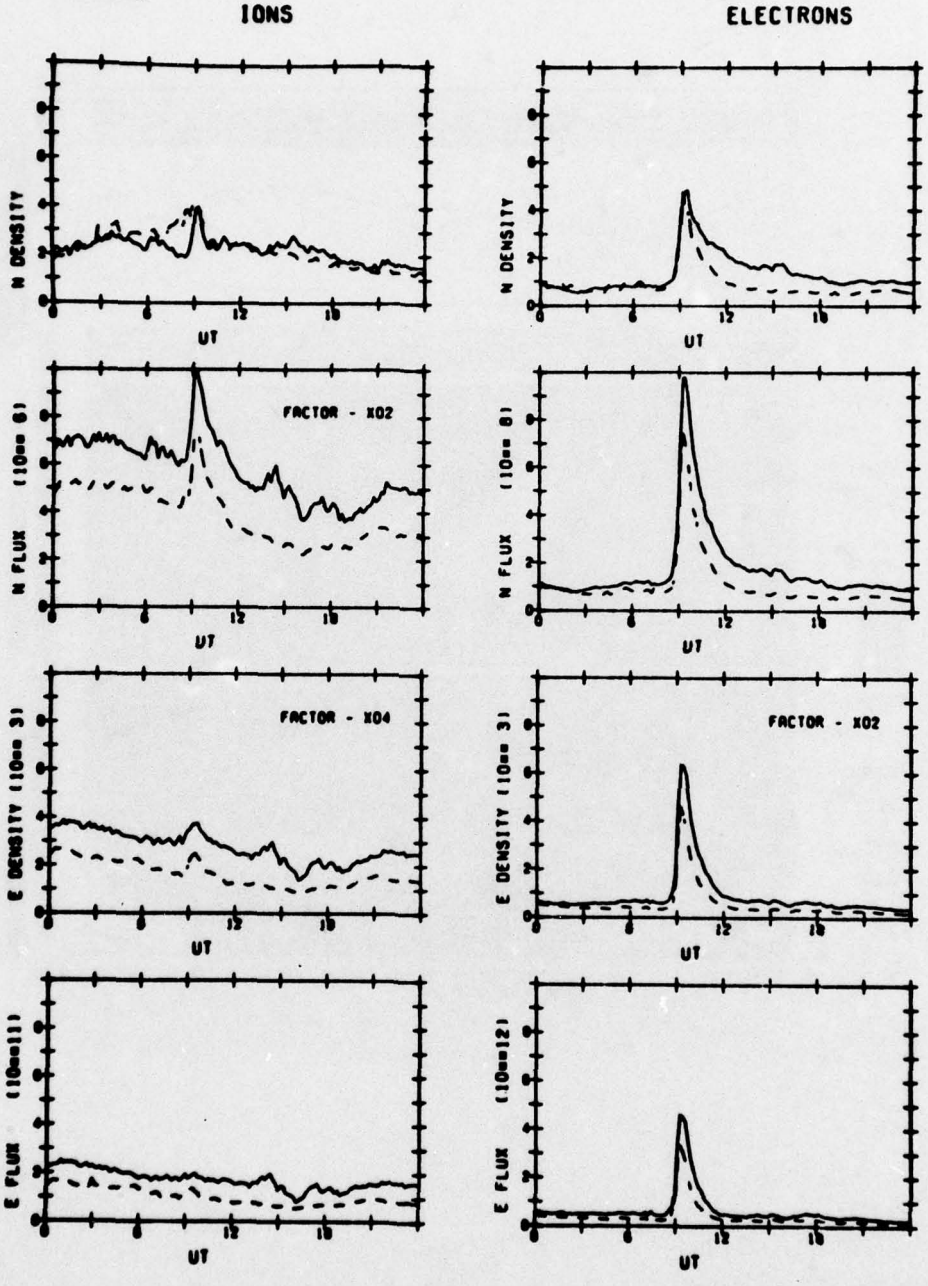
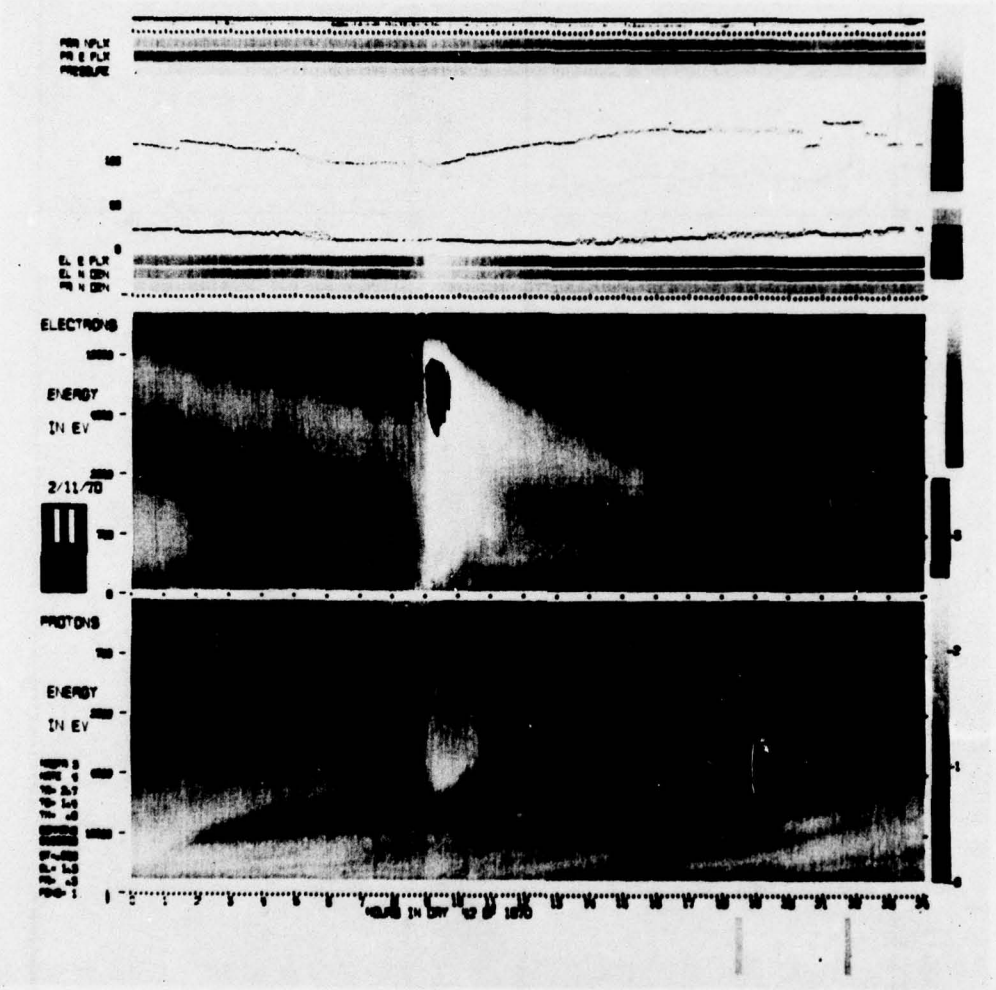
12
18

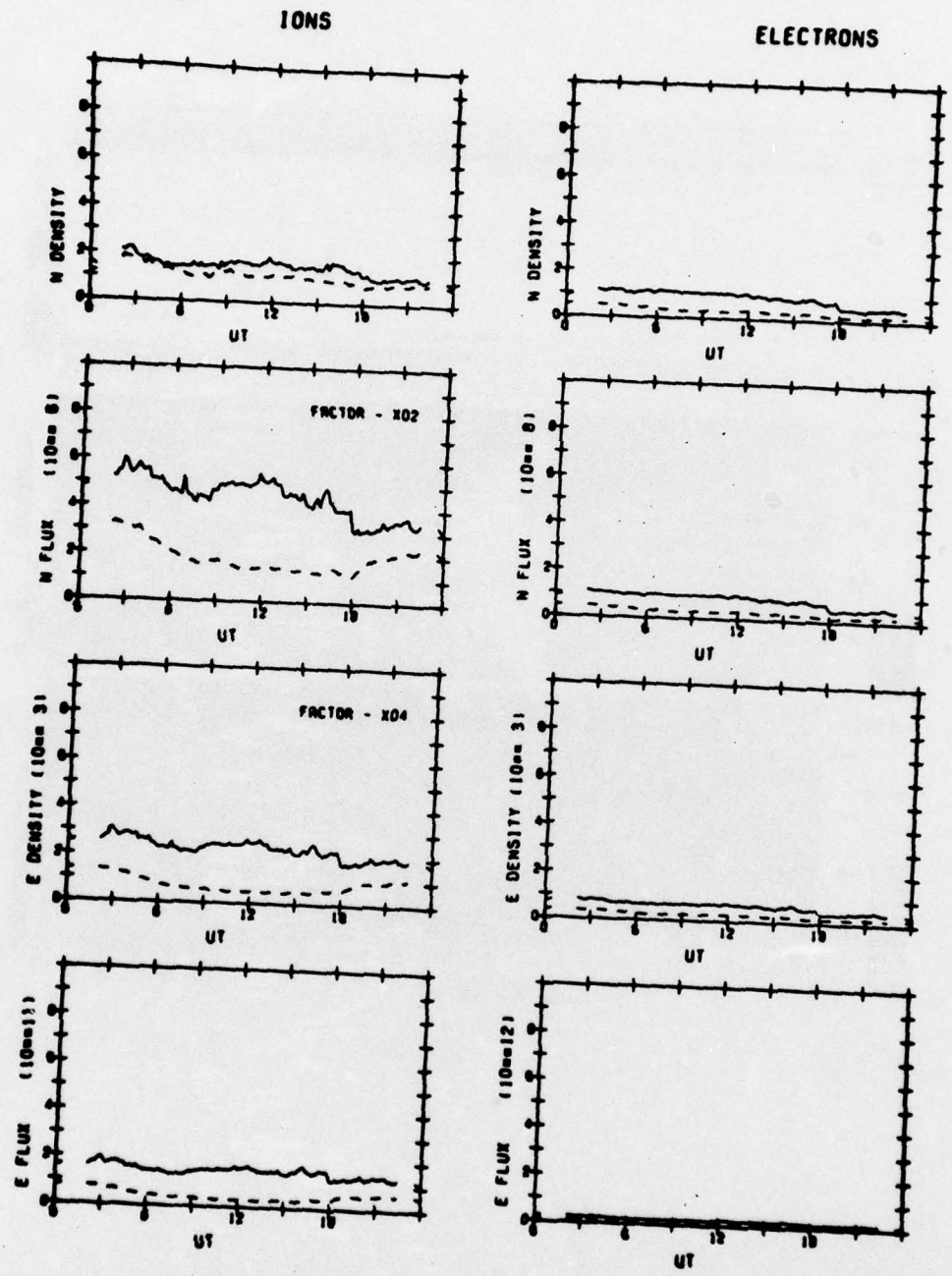


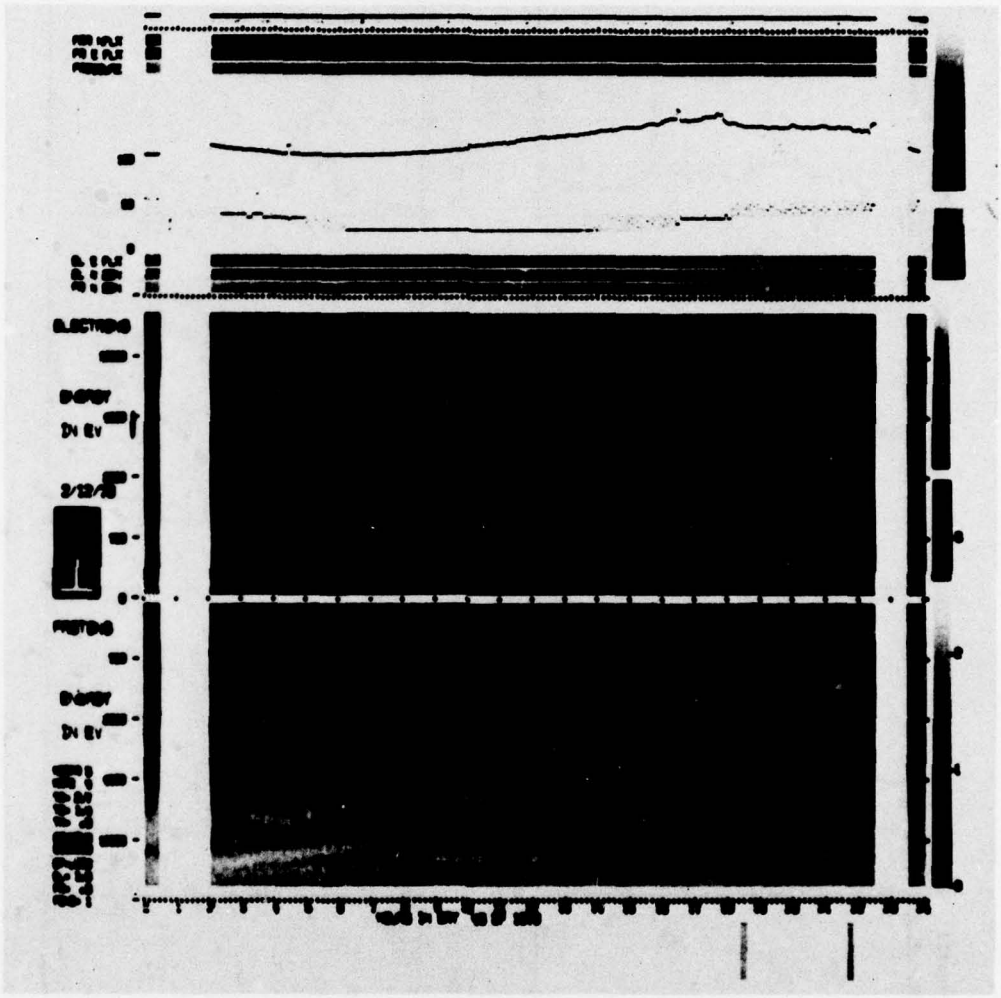
ATS-5
70/042

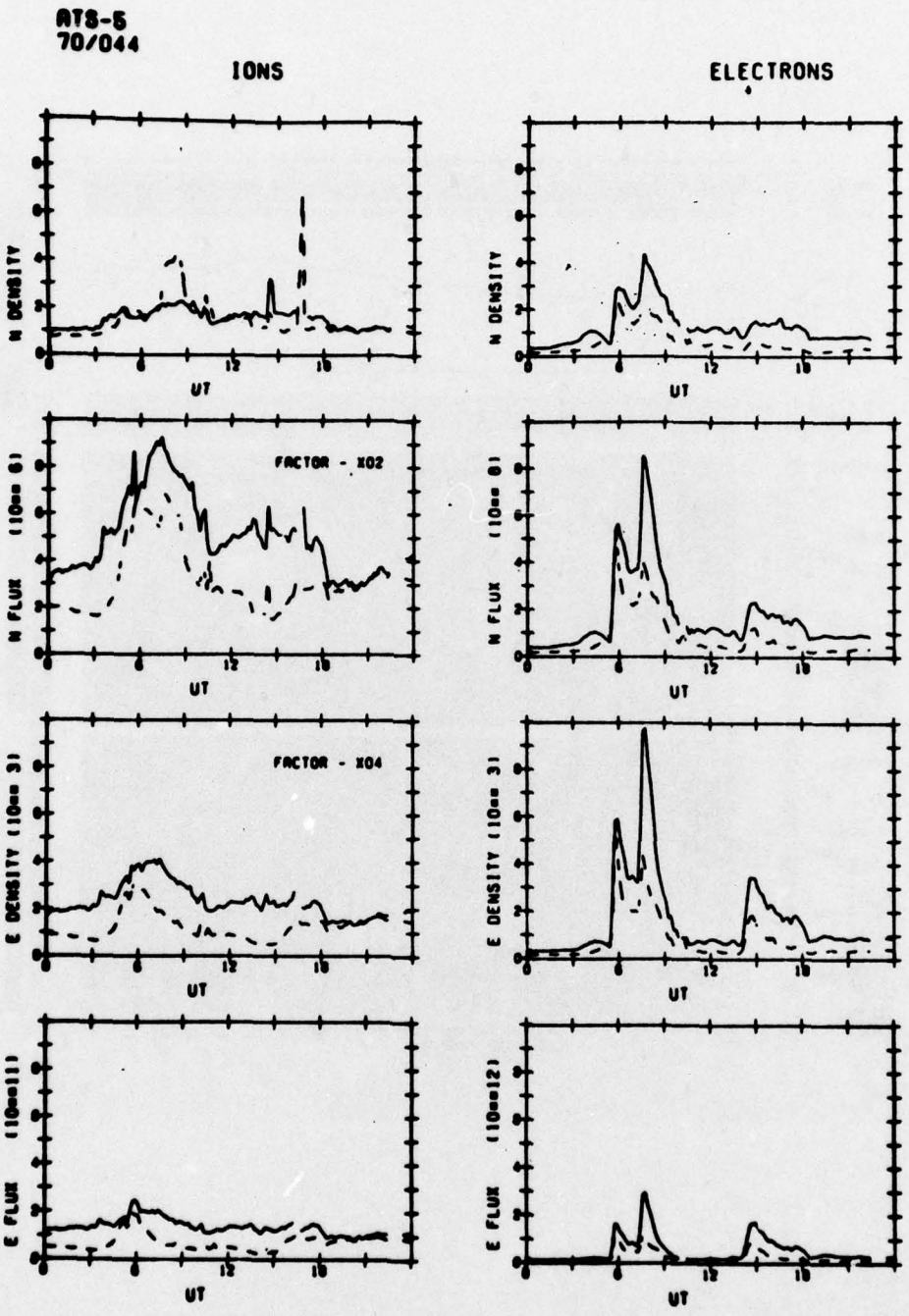

IONS
ELECTRONS
N DENSITY
N FLUX (10** 6)
FACTOR - X02
E DENSITY (10** 3)
FACTOR - X04
FACTOR - X02
E FLUX (10**11)
E FLUX (10**12)
UT
0
6
12
18

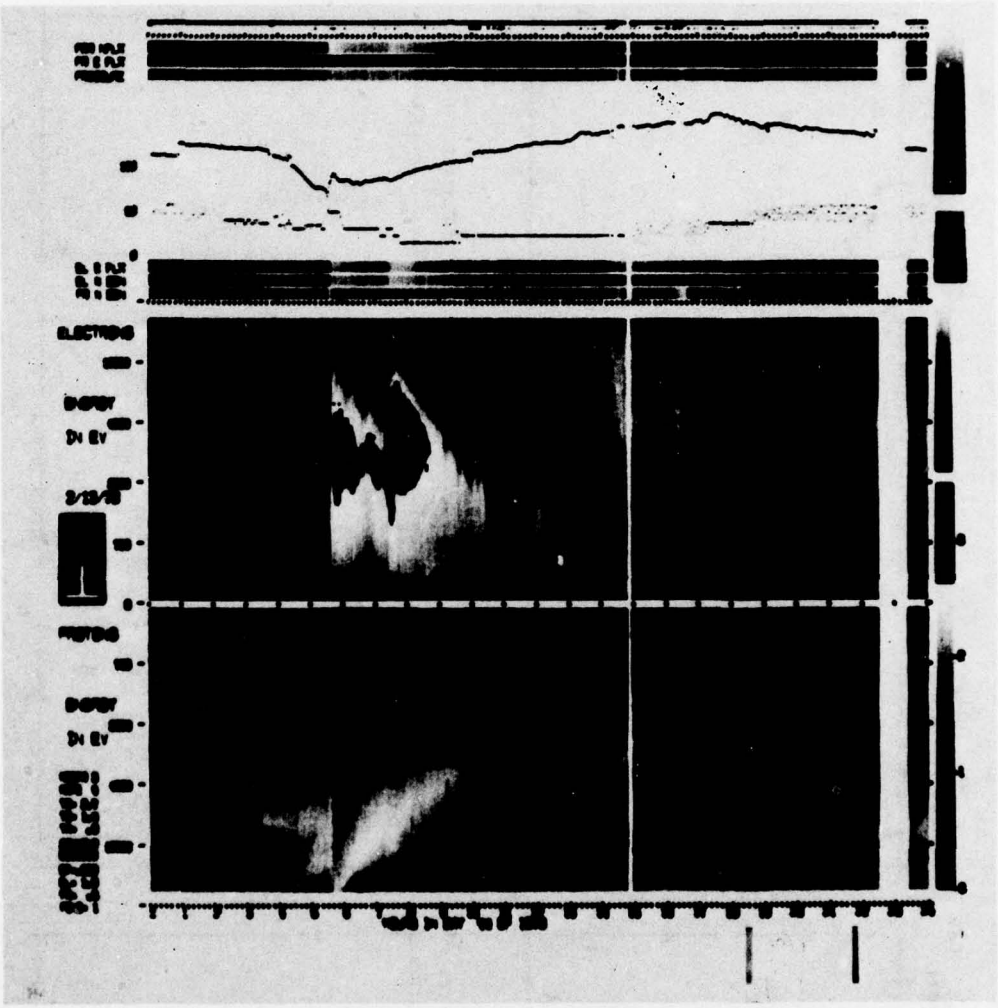

ELECTRONS
ENERGY
IN EV
2/11/70
PROTONS
ENERGY
IN EV

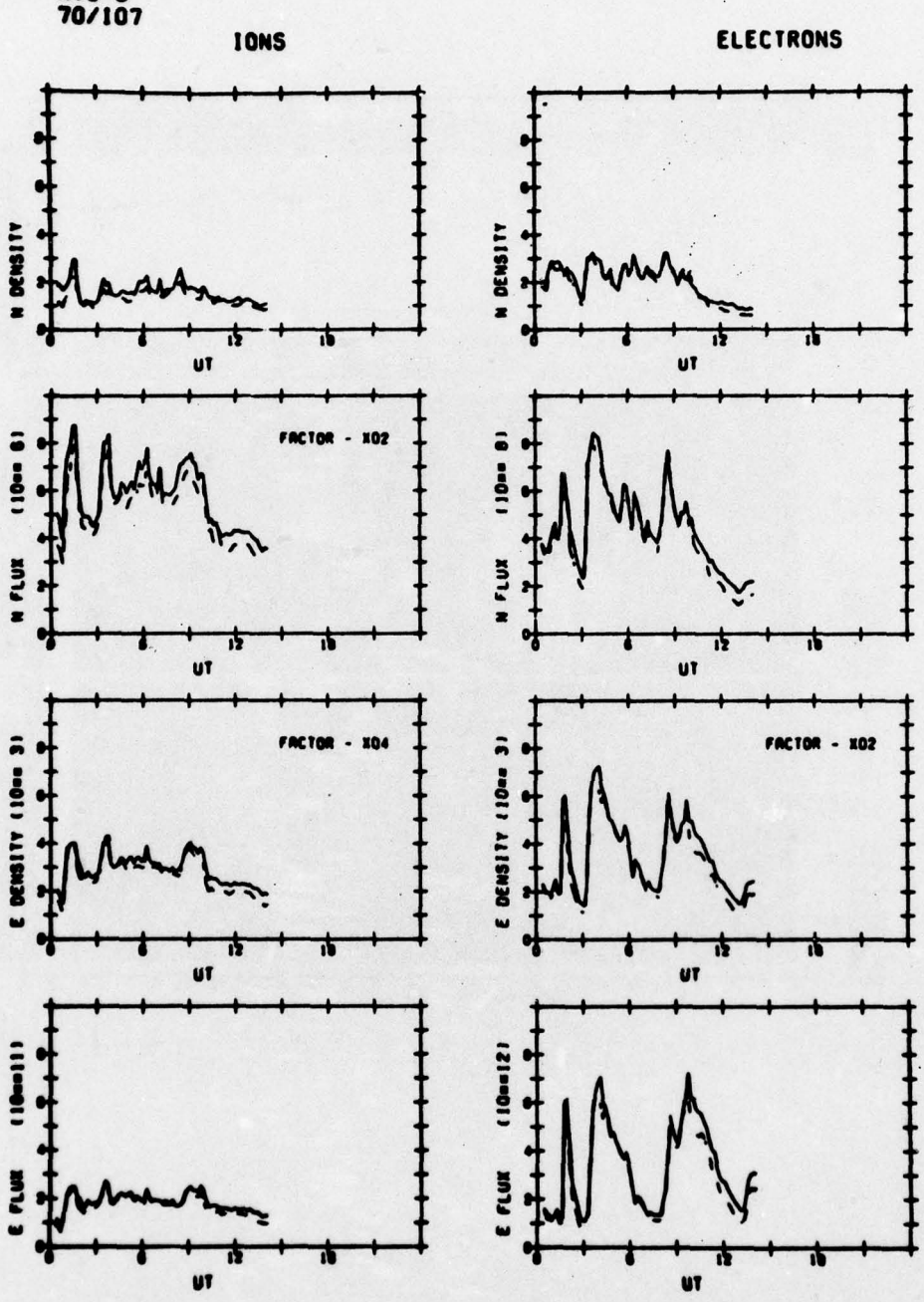
ATS-6
70/043

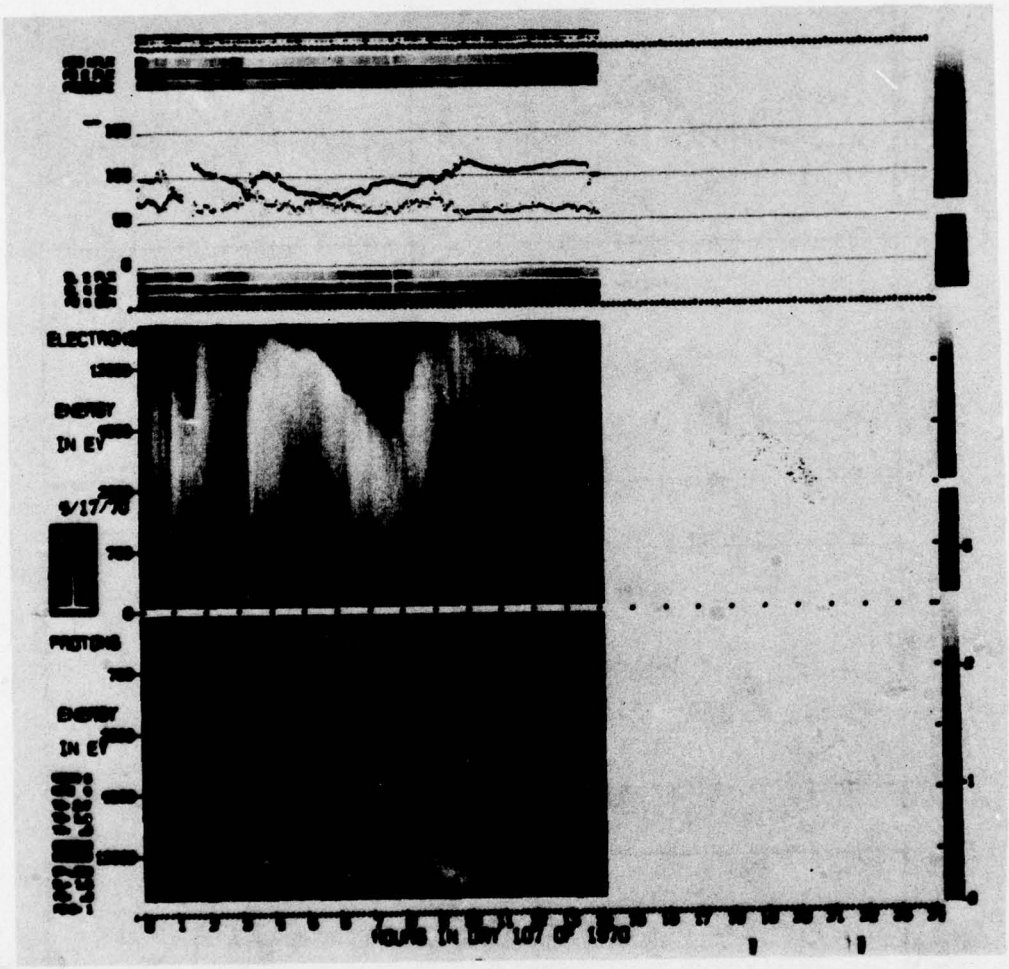

IONS
ELECTRONS
N DENSITY
UT
FACTOR - X02
N FLUX (10** 8)
FACTOR - X04
E DENSITY (10** 3)
E FLUX (10**12)
0
6
12
18




ATS-5
70/044
IONS
ELECTRONS
N DENSITY
UT
N FLUX (10** 8)
FACTOR - X02
E DENSITY (10** 3)
FACTOR - X04
E FLUX (10**11)
E FLUX (10**12)
0
6
12
18




ATS-5
70/107
IONS
ELECTRONS
N DENSITY
UT
N FLUX (10= 8)
FACTOR - X02
E DENSITY (10= 3)
FACTOR - X04
FACTOR - X02
E FLUX (10=11)
E FLUX (10=12)
0
6
12
18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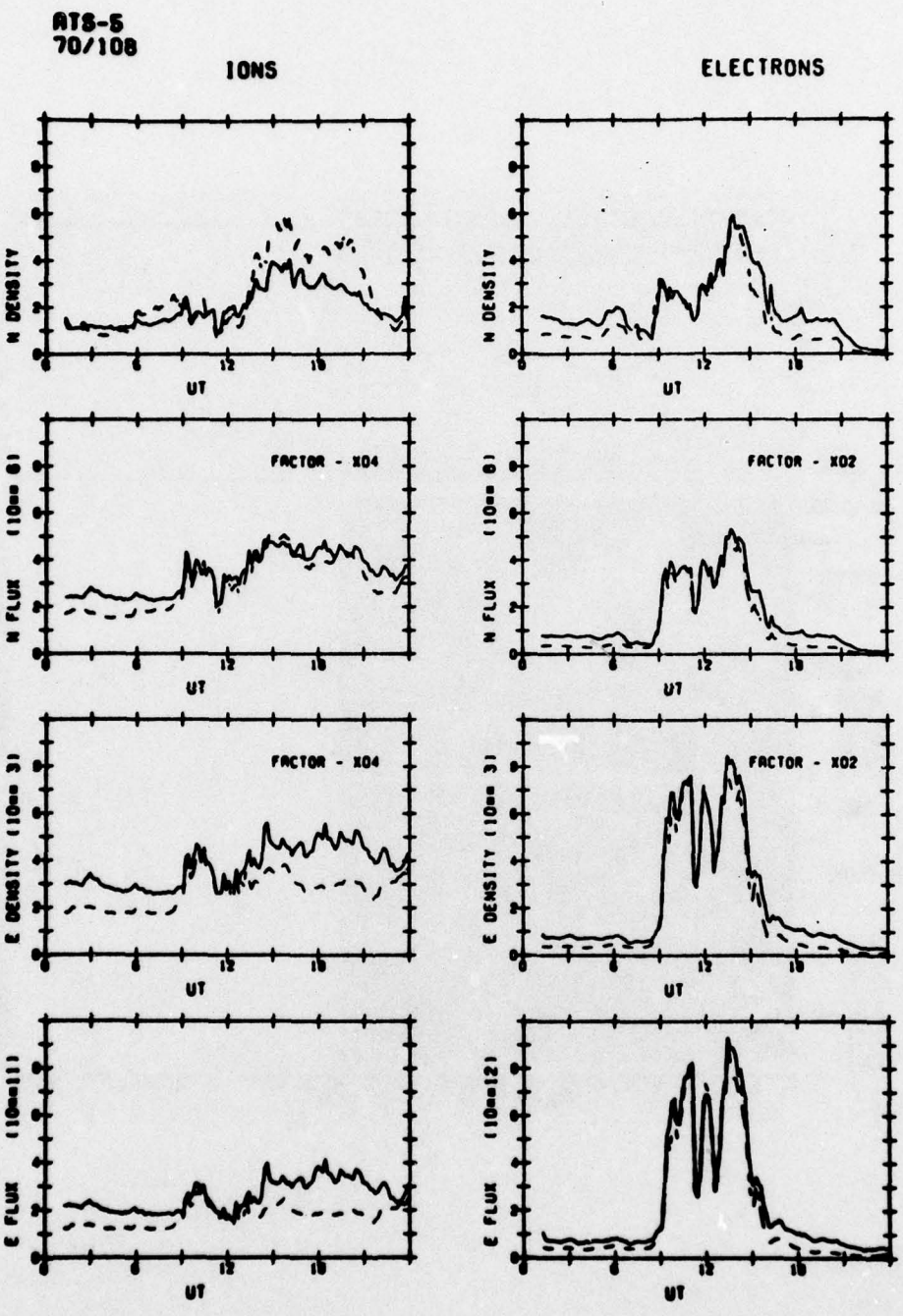
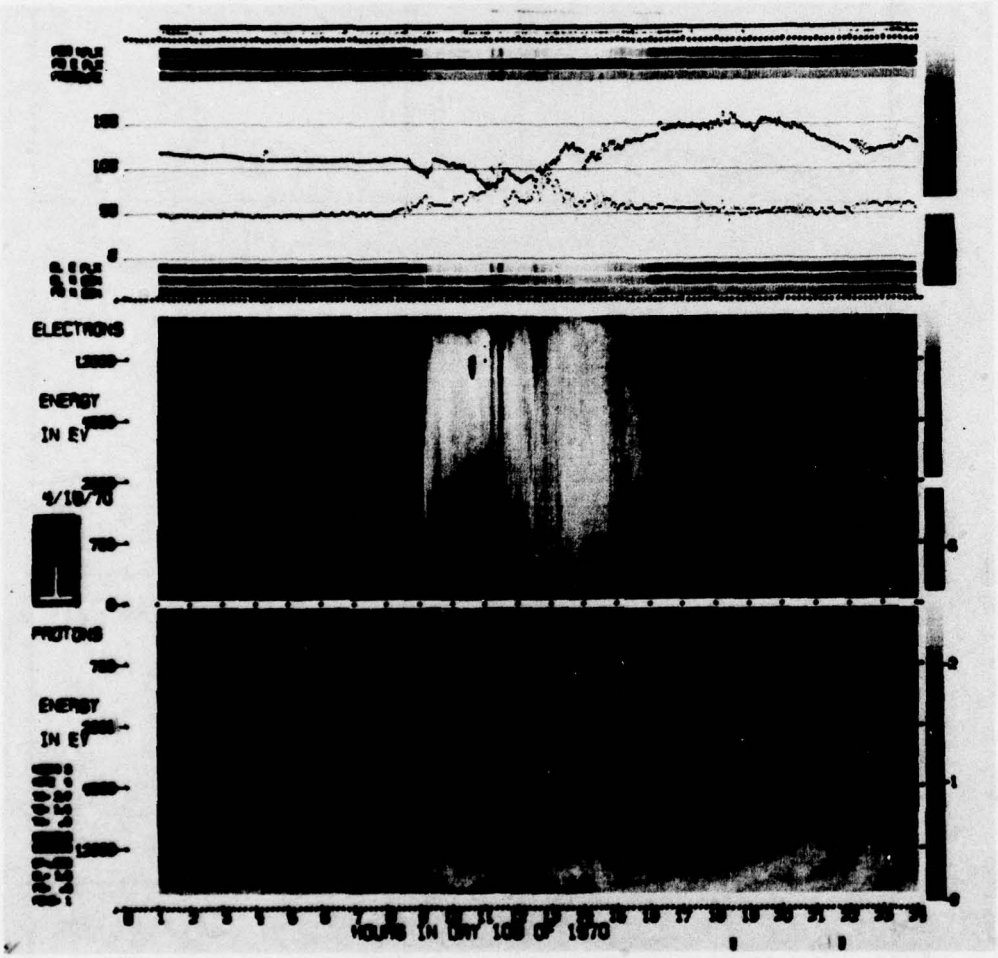
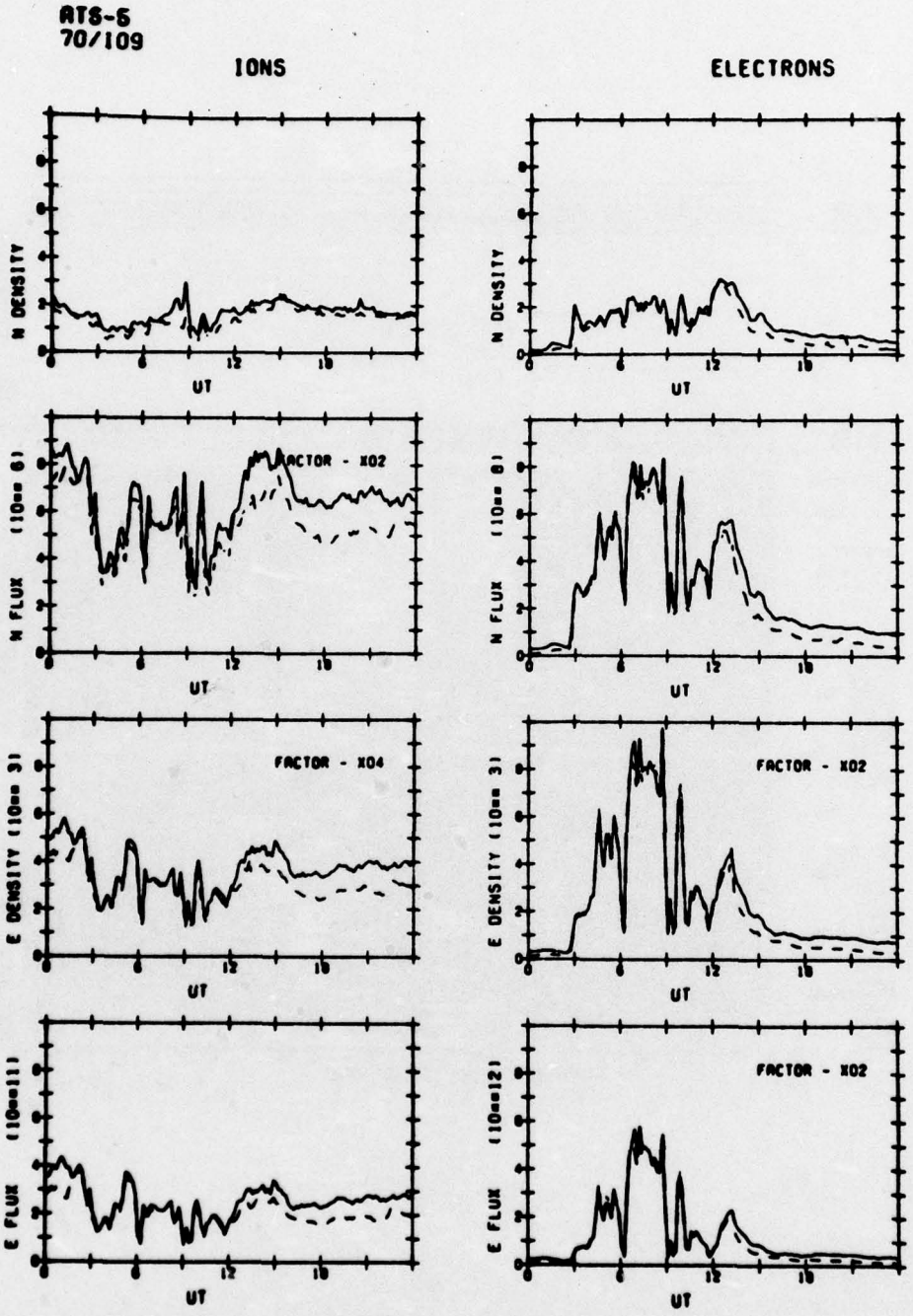
ENERGY
IN EV
9/17/70
PROTONS
ENERGY
IN EV


ATS-5
70/108
IONS
ELECTRONS
N DENSITY
N FLUX (10ⁿ= 6)
FACTOR - X04
FACTOR - X02
E DENSITY (10ⁿ= 3)
E FLUX (10ⁿ=11)
E FLUX (10ⁿ=12)
UT
6
12
18


ELECTRONS
ENERGY
IN EV
4/10/70
PROTONS
ENERGY
IN EV


ATS-5
70/109
IONS
ELECTRONS
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UT
N FLUX (10= 6)
FACTOR - X02
E DENSITY (10= 3)
FACTOR - X04
FACTOR - X02
E FLUX (10=11)
E FLUX (10=12)
FACTOR - X02
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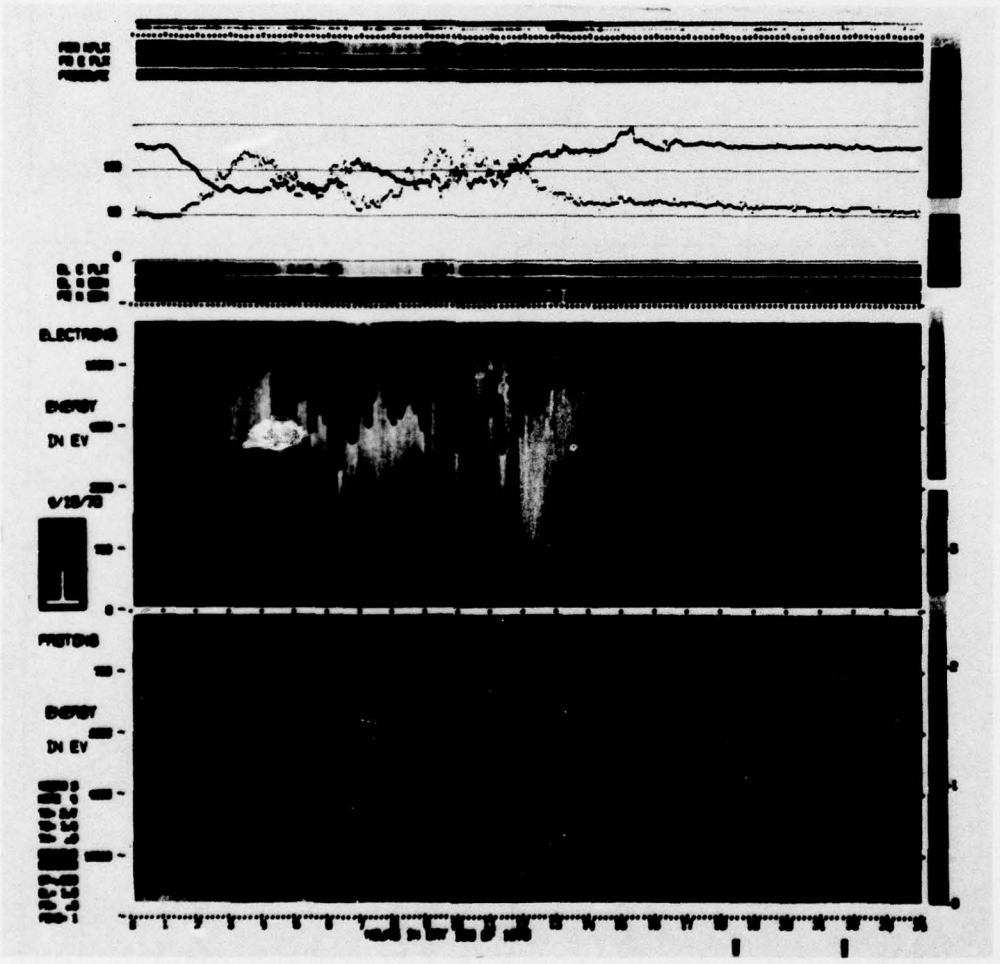
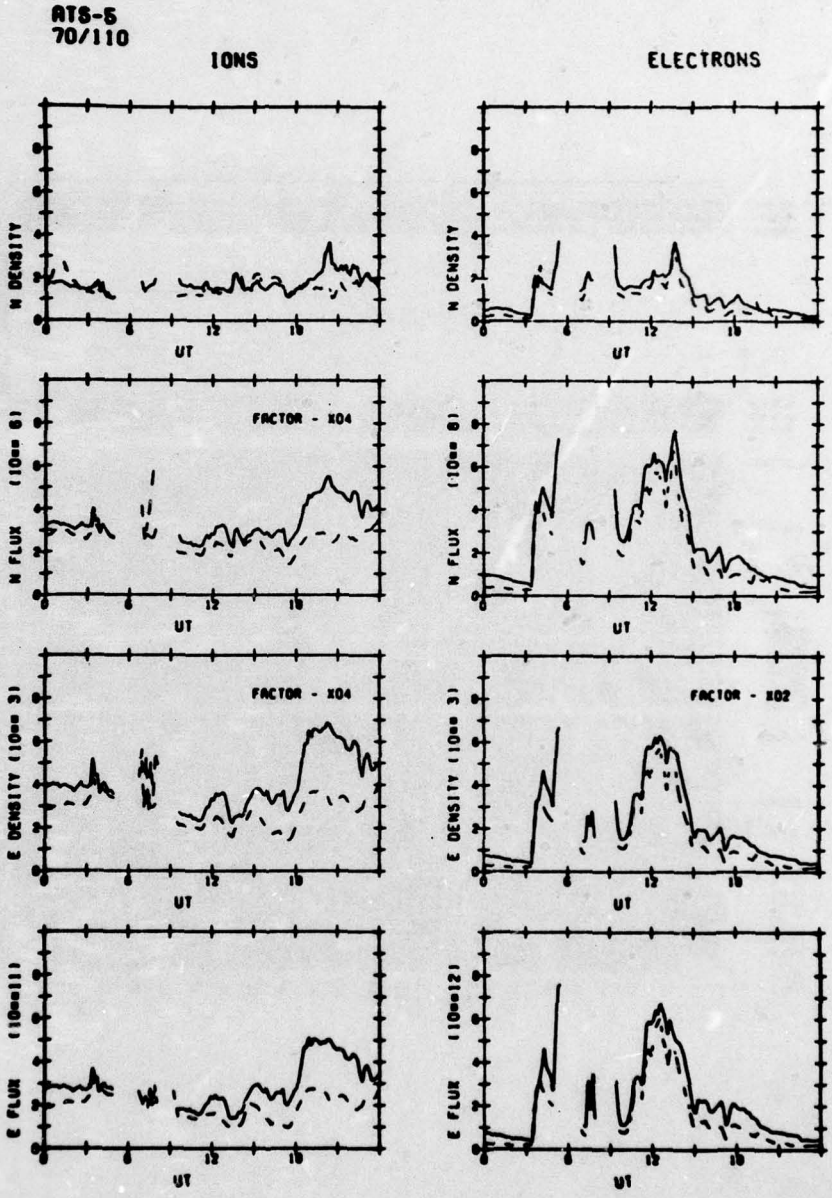
6
12
18


ELECTRONS
ENERGY
IN EV
PROTONS
ENERGY
IN EV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70/110
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FACTOR - X04
E DENSITY (10** 3)
FACTOR - X04
FACTOR - X02
E FLUX (10**11)
E FLUX (10**12)
UT
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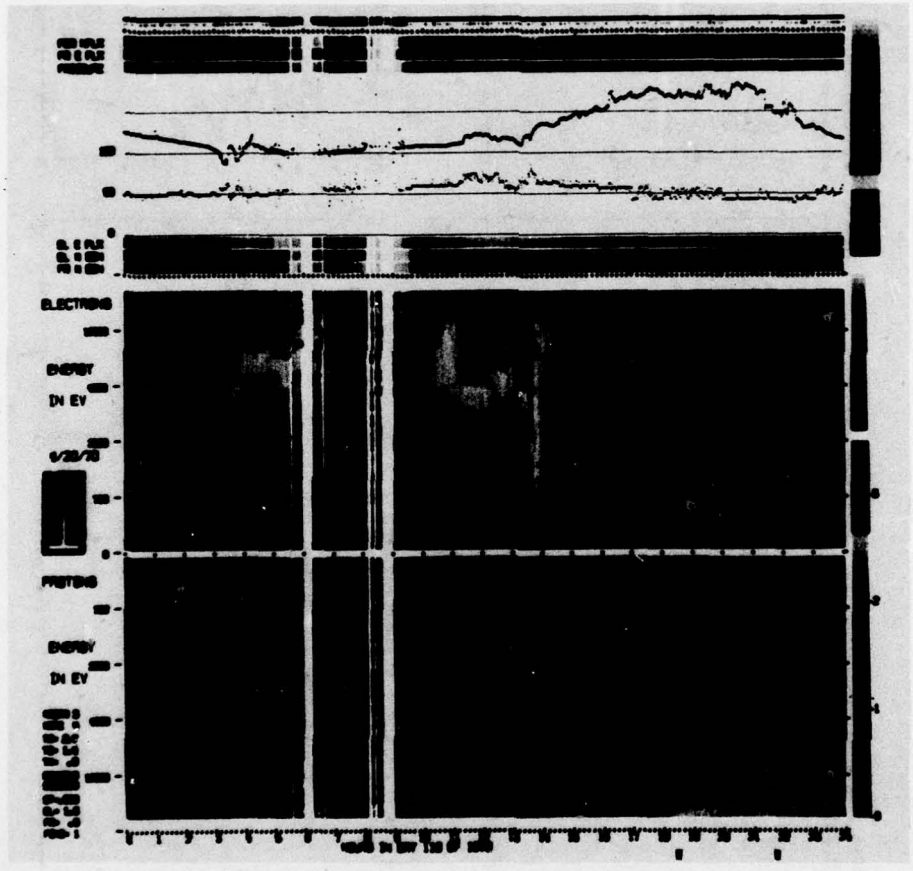
12
18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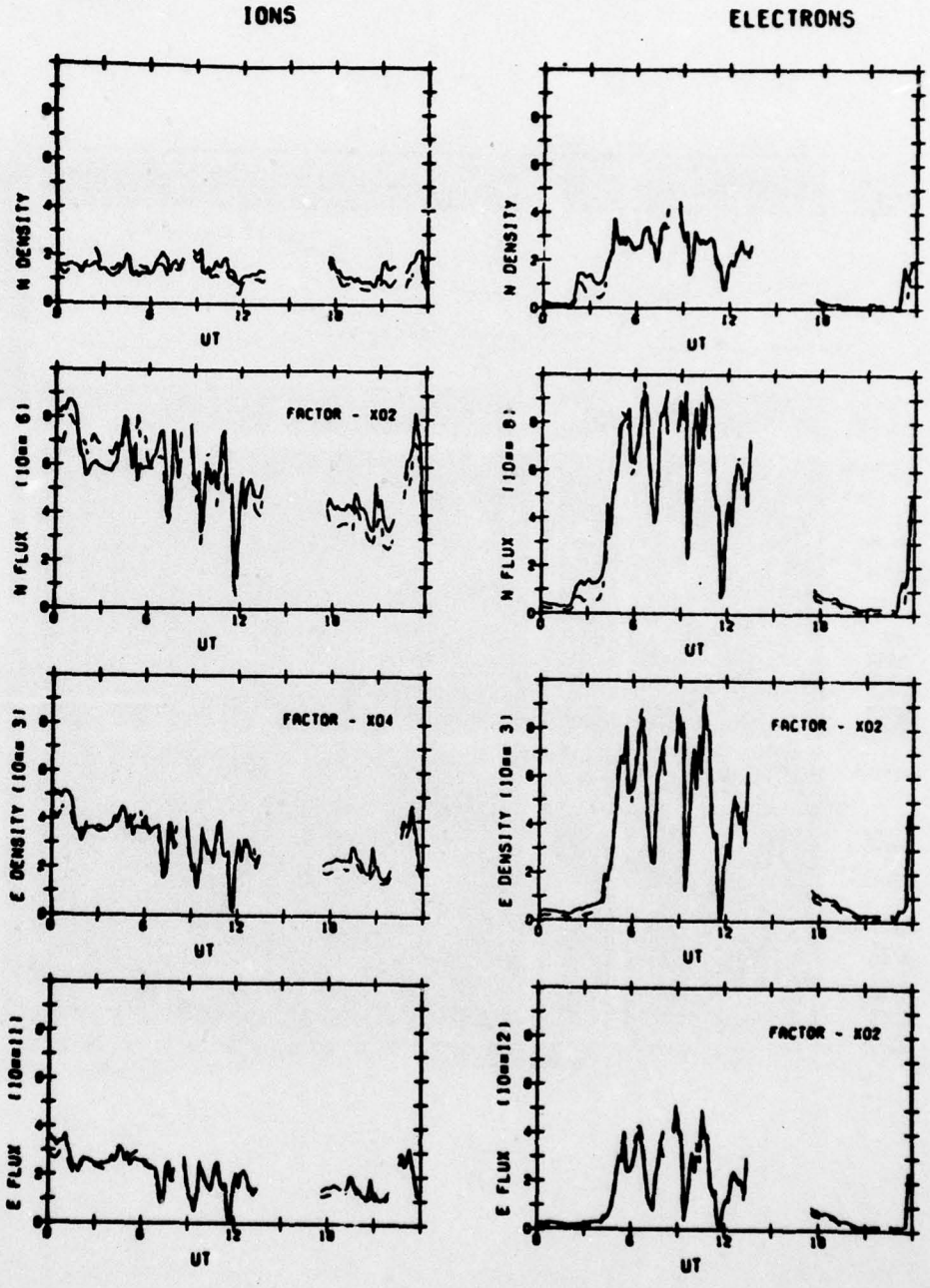
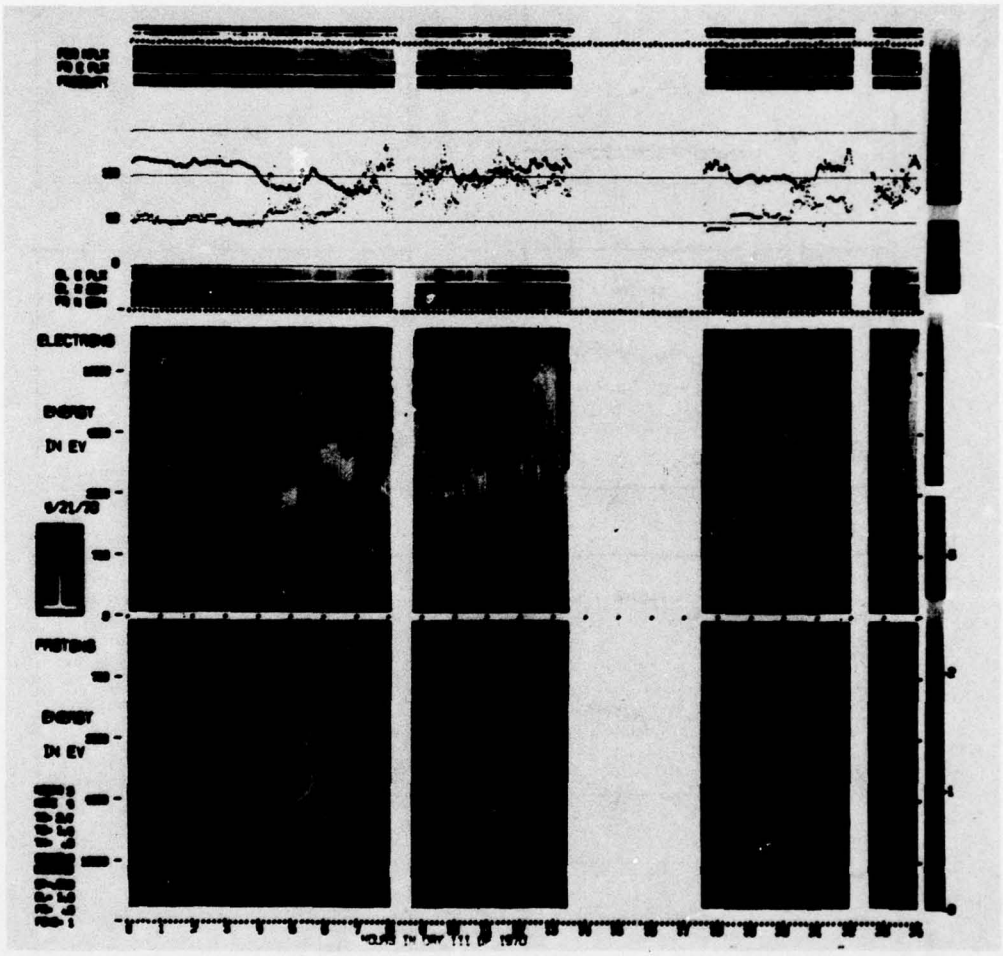
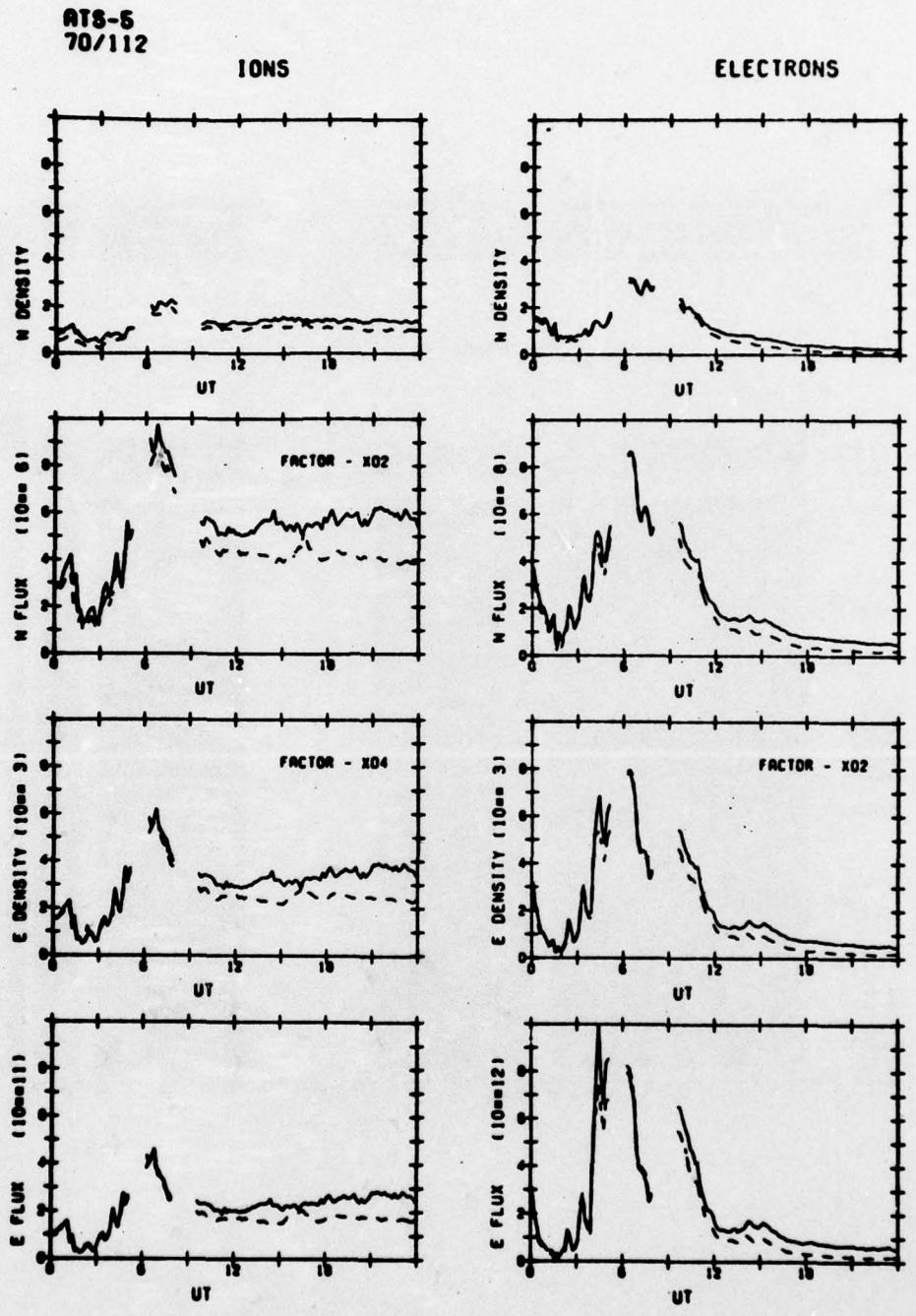
ENERGY
IN EV
PROTONS
ENERGY
IN EV

ATS-5
70/111


IONS
ELECTRONS
N DENSITY
N FLUX (10** 6)
FACTOR - X02
E DENSITY (10** 3)
FACTOR - X04
FACTOR - X02
E FLUX (10**11)
E FLUX (10**12)
FACTOR - X02
UT
0
6
12
18


ELECTRONS
ENERGY
IN EV
PROTONS
ENERGY
IN EV


ATS-6
70/112
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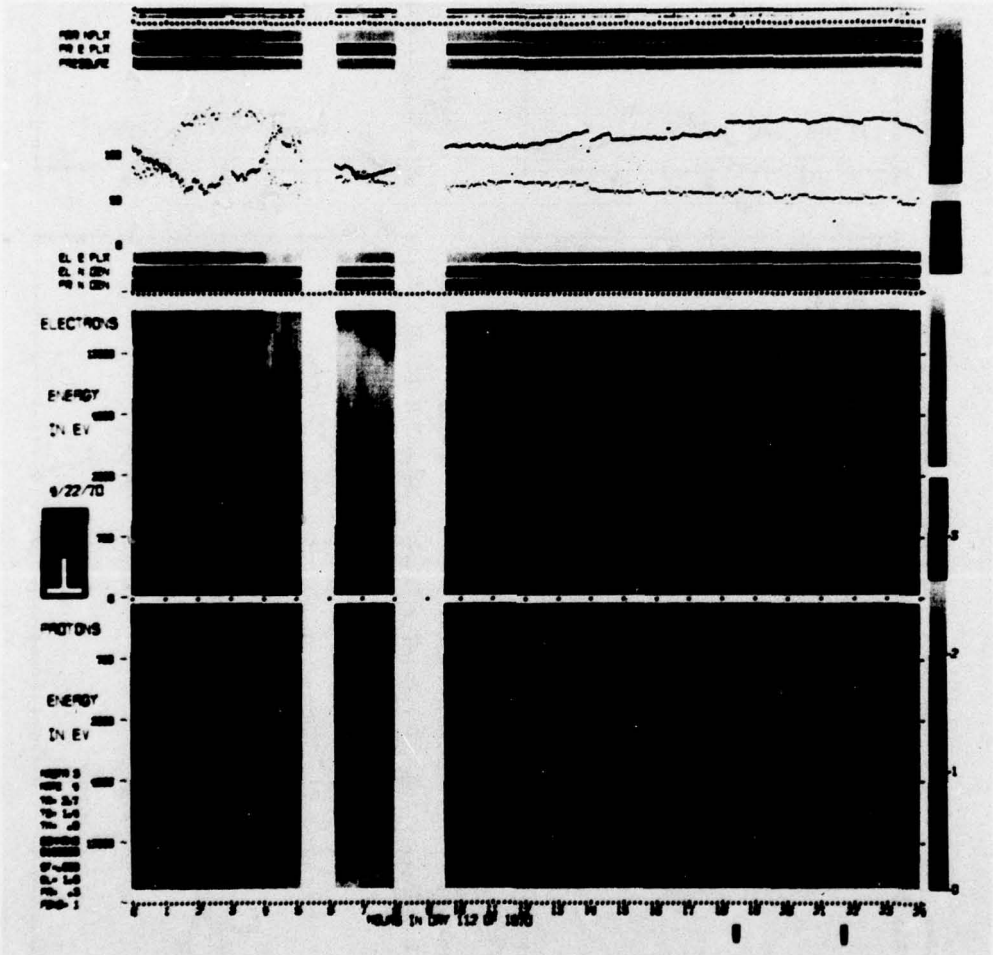
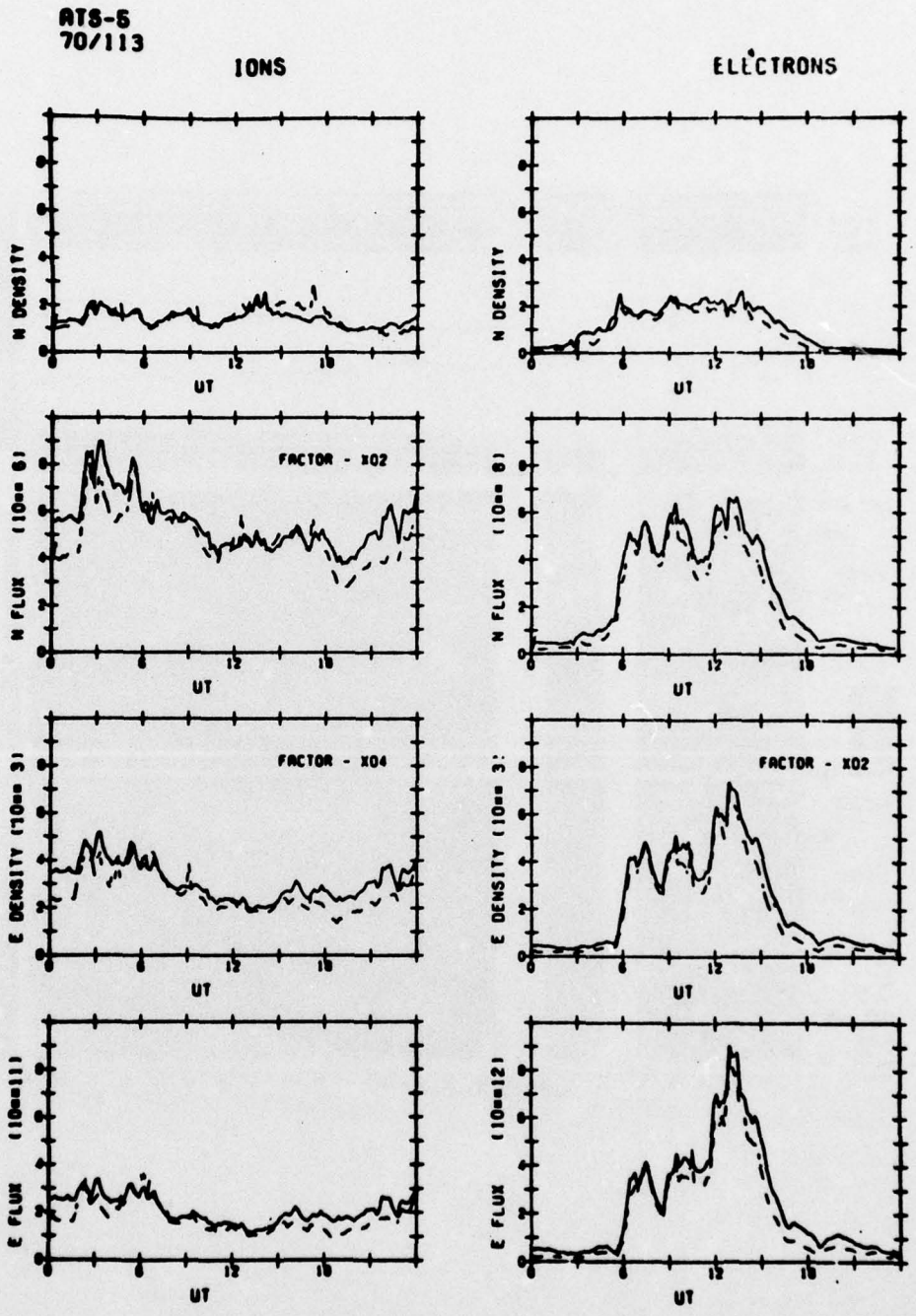
FACTOR - X02
E DENSITY (10** 3)
FACTOR - X04
FACTOR - X02
E FLUX (10**11)
E FLUX (10**12)
UT
0
6
12
18
2
4
6
8


ELECTRONS
ENERGY
IN EV
9/22/70
PROTONS
ENERGY
IN EV


ATS-6
70/113
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ELECTRONS
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FACTOR - X02
E DENSITY (10** 3)
FACTOR - X04
FACTOR - X02
E FLUX (10**11)
E FLUX (10**12)
UT
0
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6
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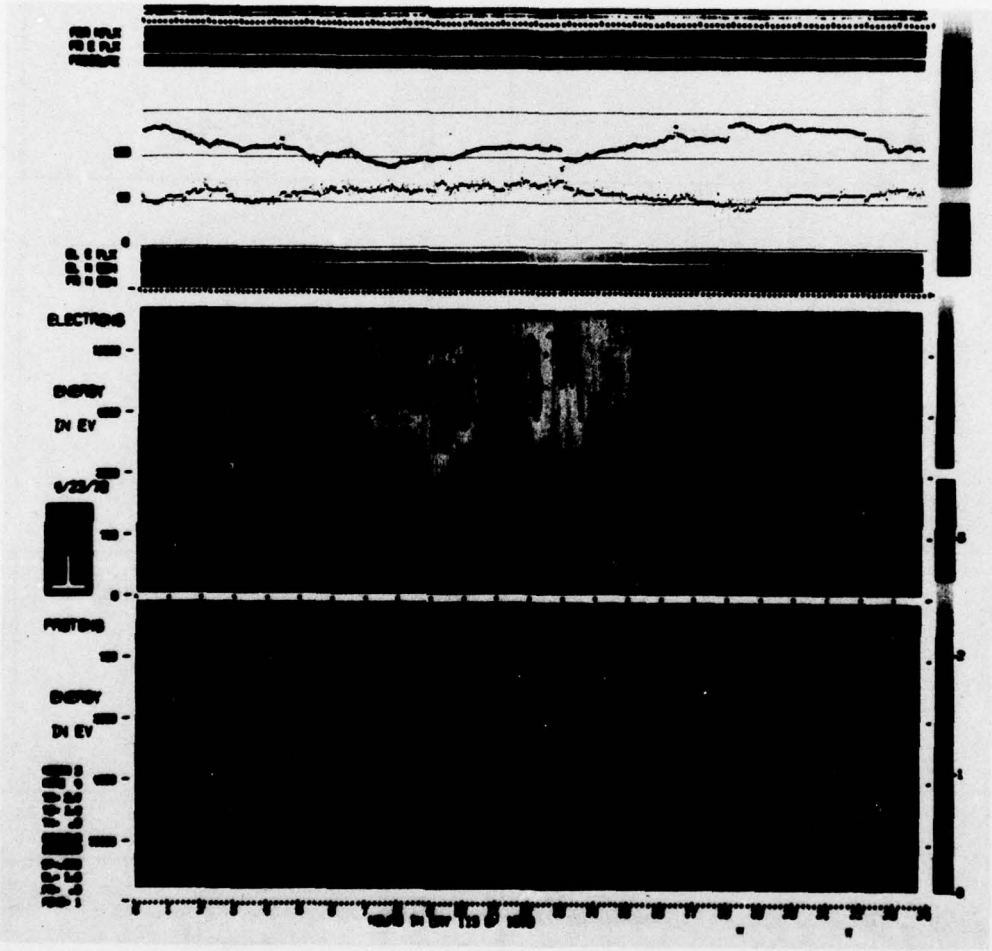
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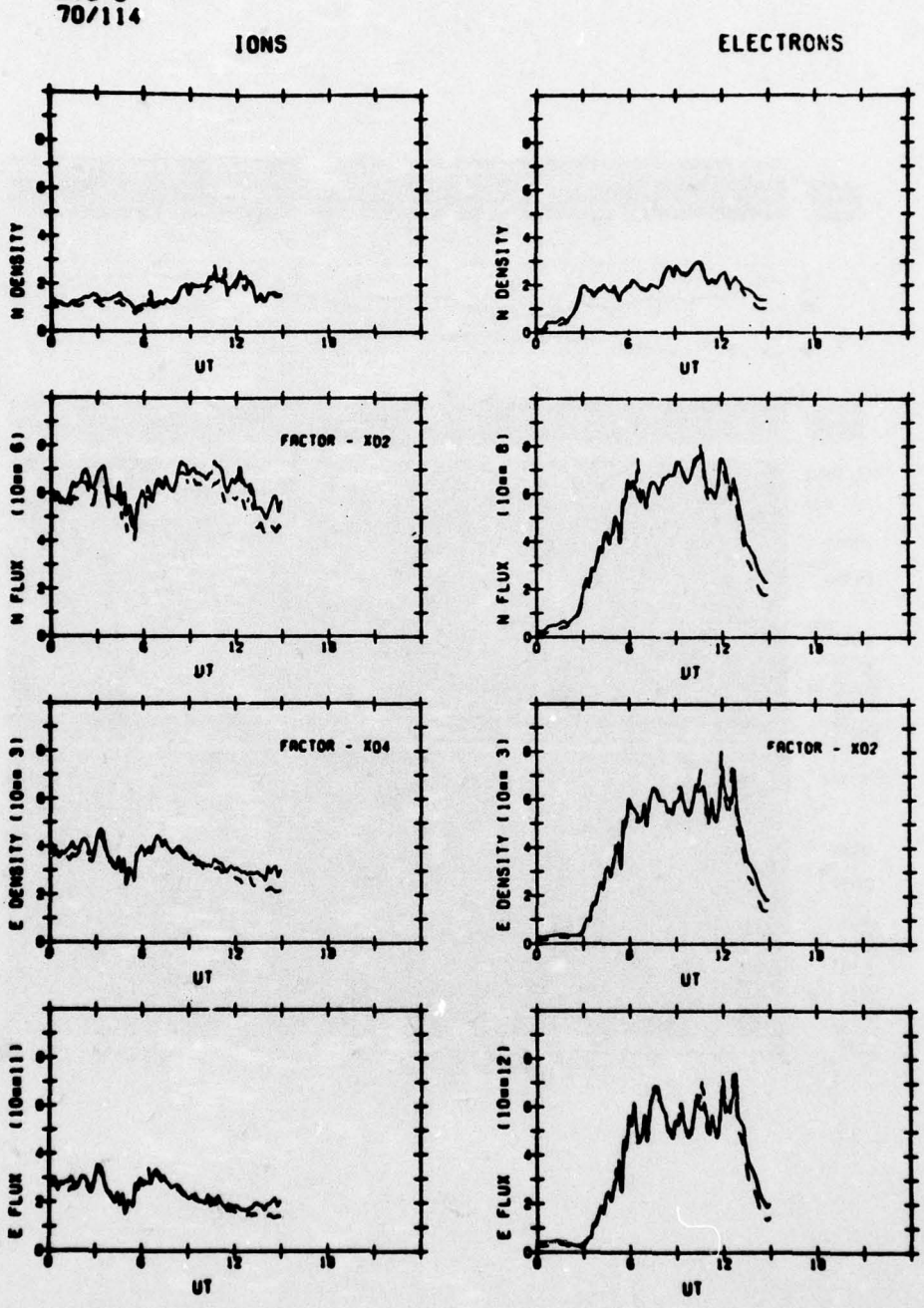
DIGITAL
IN EV
PROTONS
DIGITAL
IN EV

ATS-5
70/114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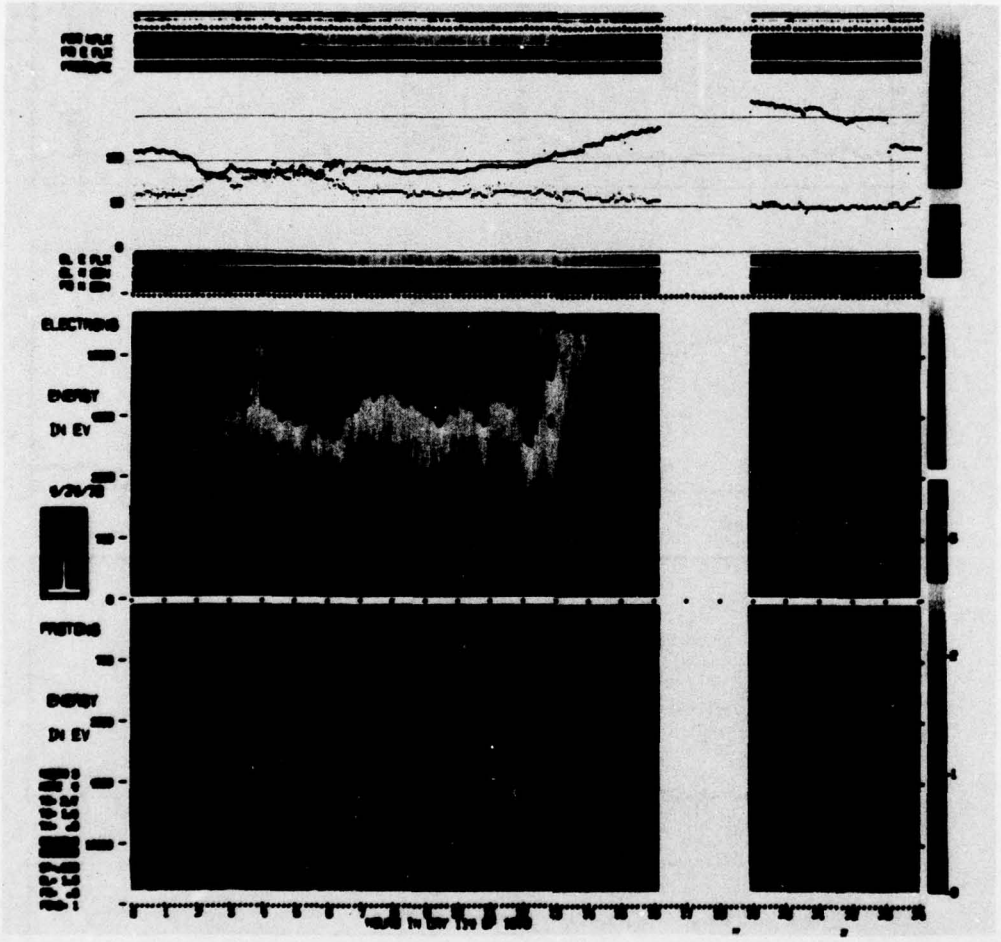
ELECTRONS
N DENSITY
N FLUX (10** 6)
FACTOR - X02
E DENSITY (10** 3)
FACTOR - X04
FACTOR - X02
E FLUX (10**11)
E FLUX (10**12)
UT
0
6
12
18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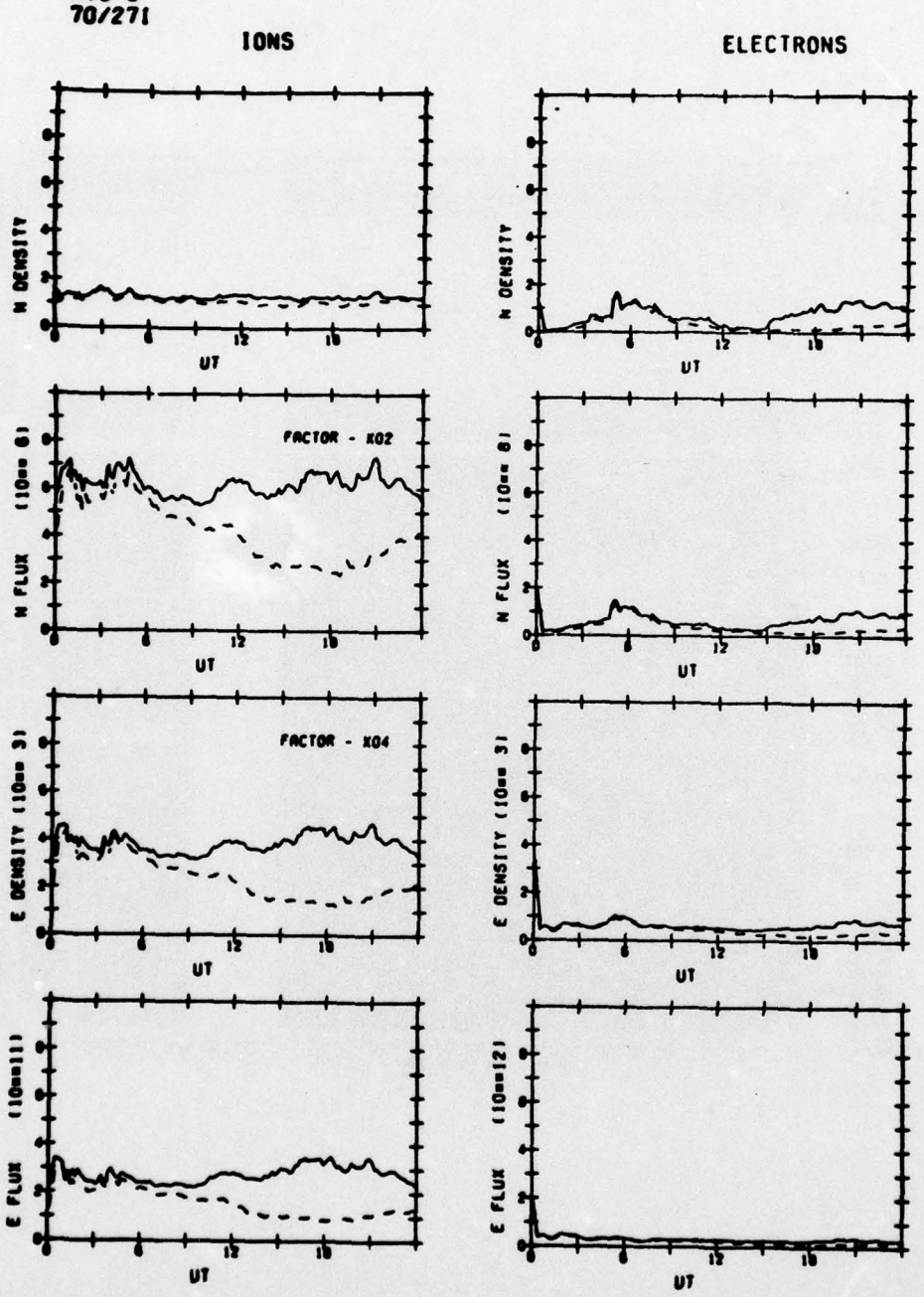
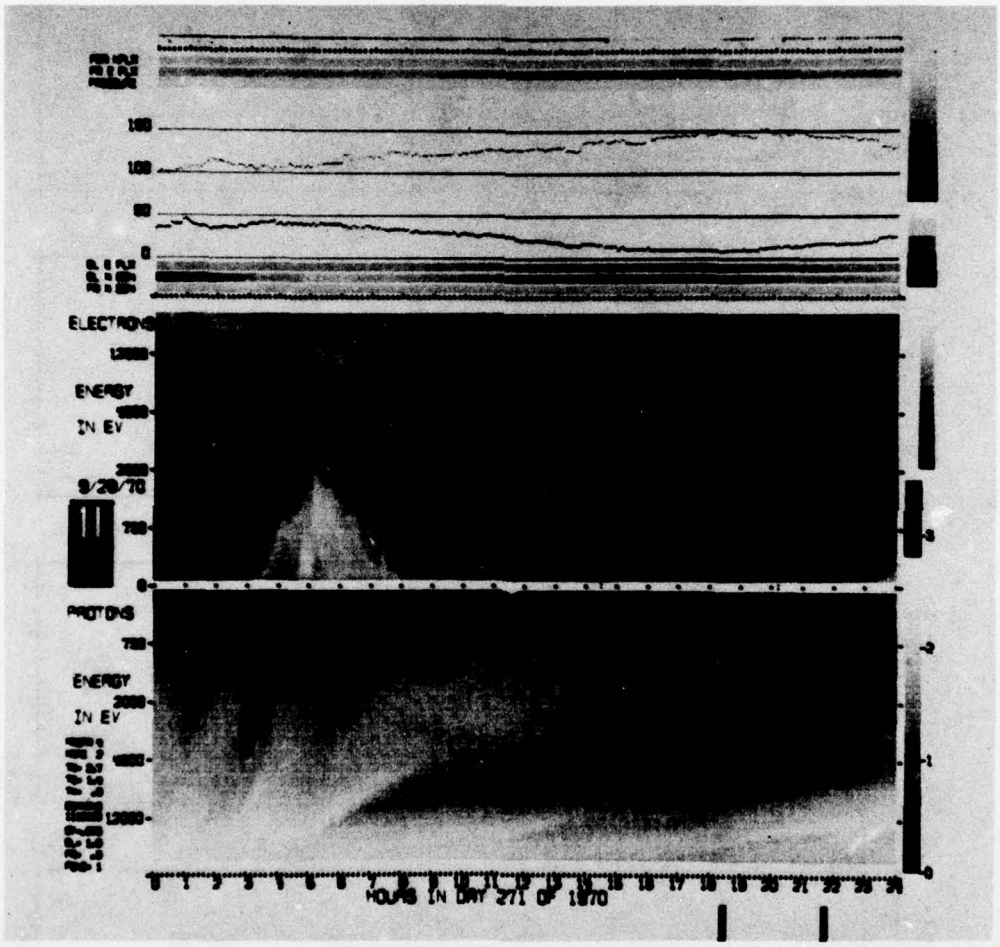
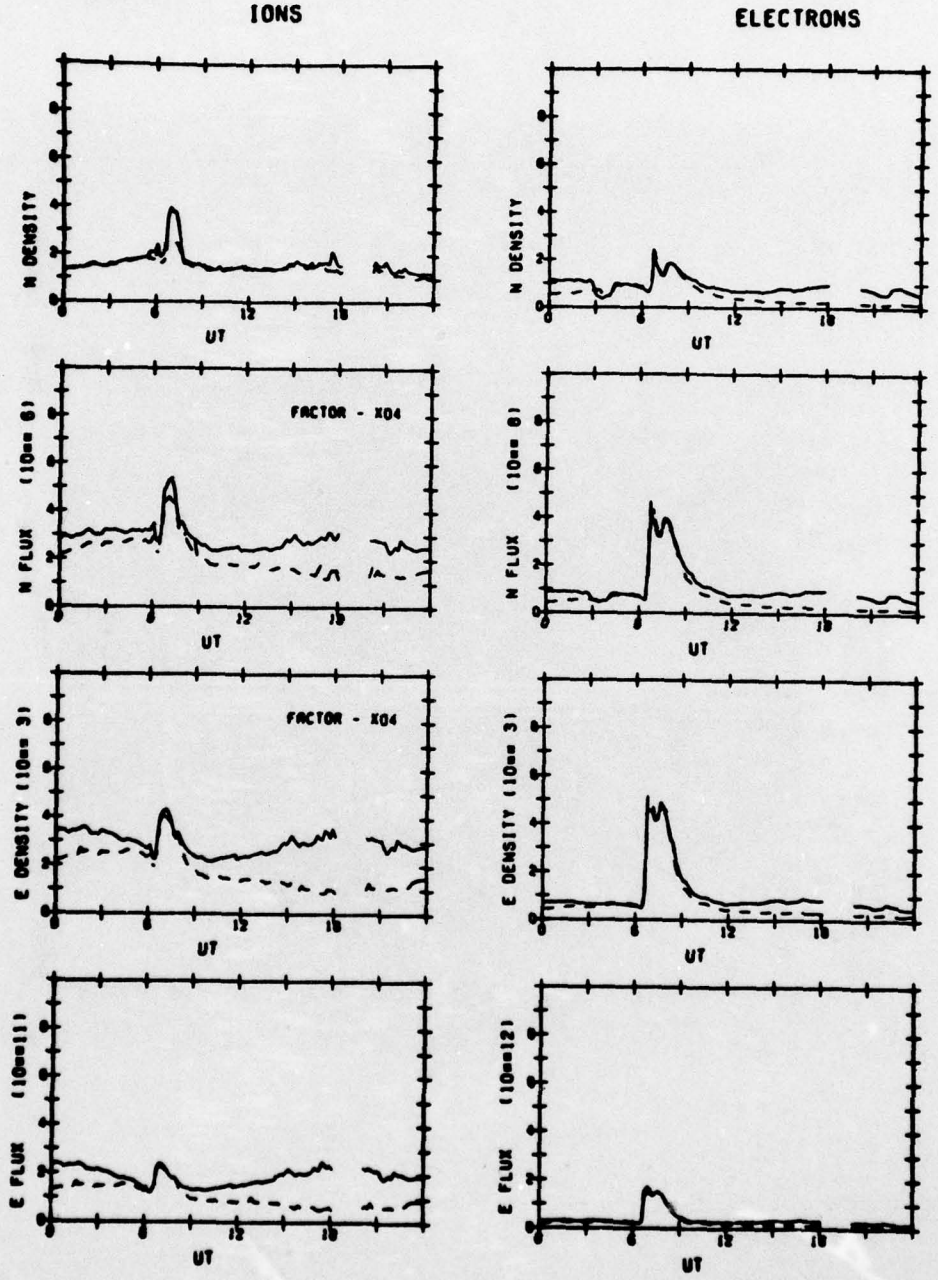
ENERGY
IN EV
PROTONS
ENERGY
IN EV

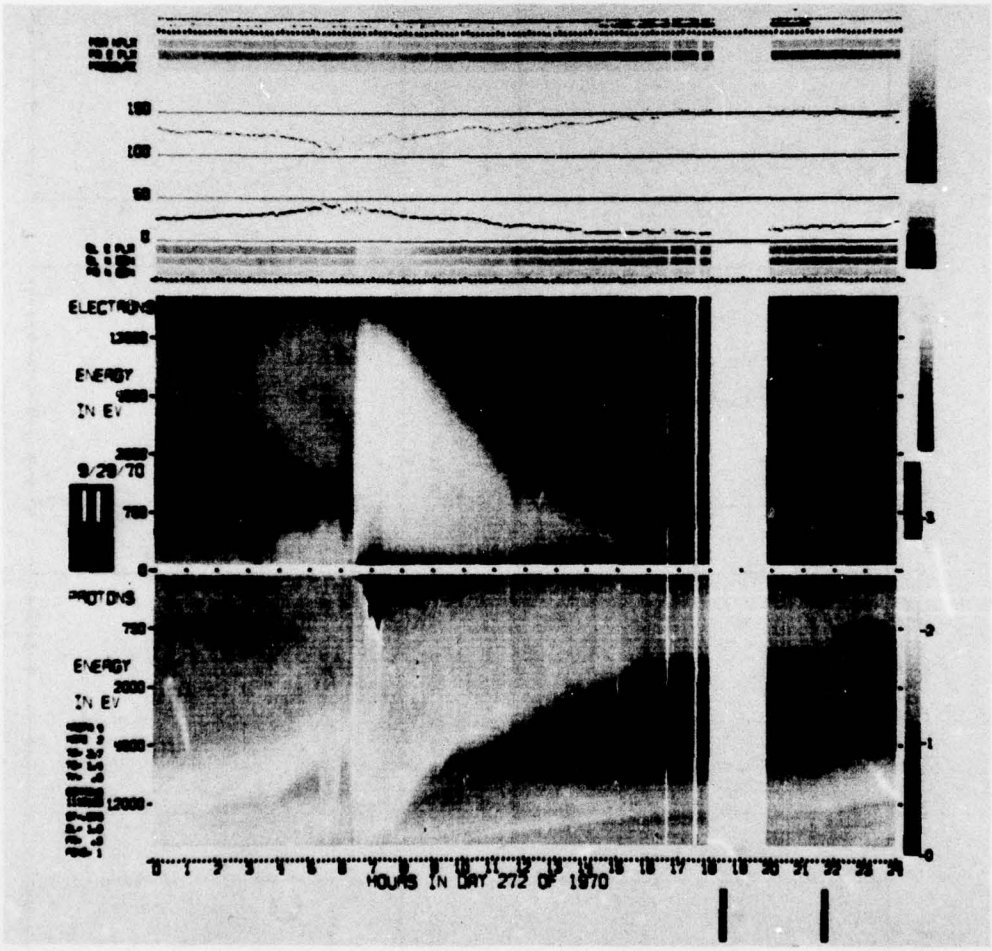
ATS-5
70/271


IONS
ELECTRONS
N DENSITY
UT
FACTOR - X02
N FLUX (10** 8)
FACTOR - X04
E DENSITY (10** 3)
E FLUX (10**11)
E FLUX (10**12)
0
6
12
18


ELECTRONS
ENERGY
IN EV
9/28/70
PROTONS
ENERGY
IN EV
HOURS IN DAY 271 OF 1970

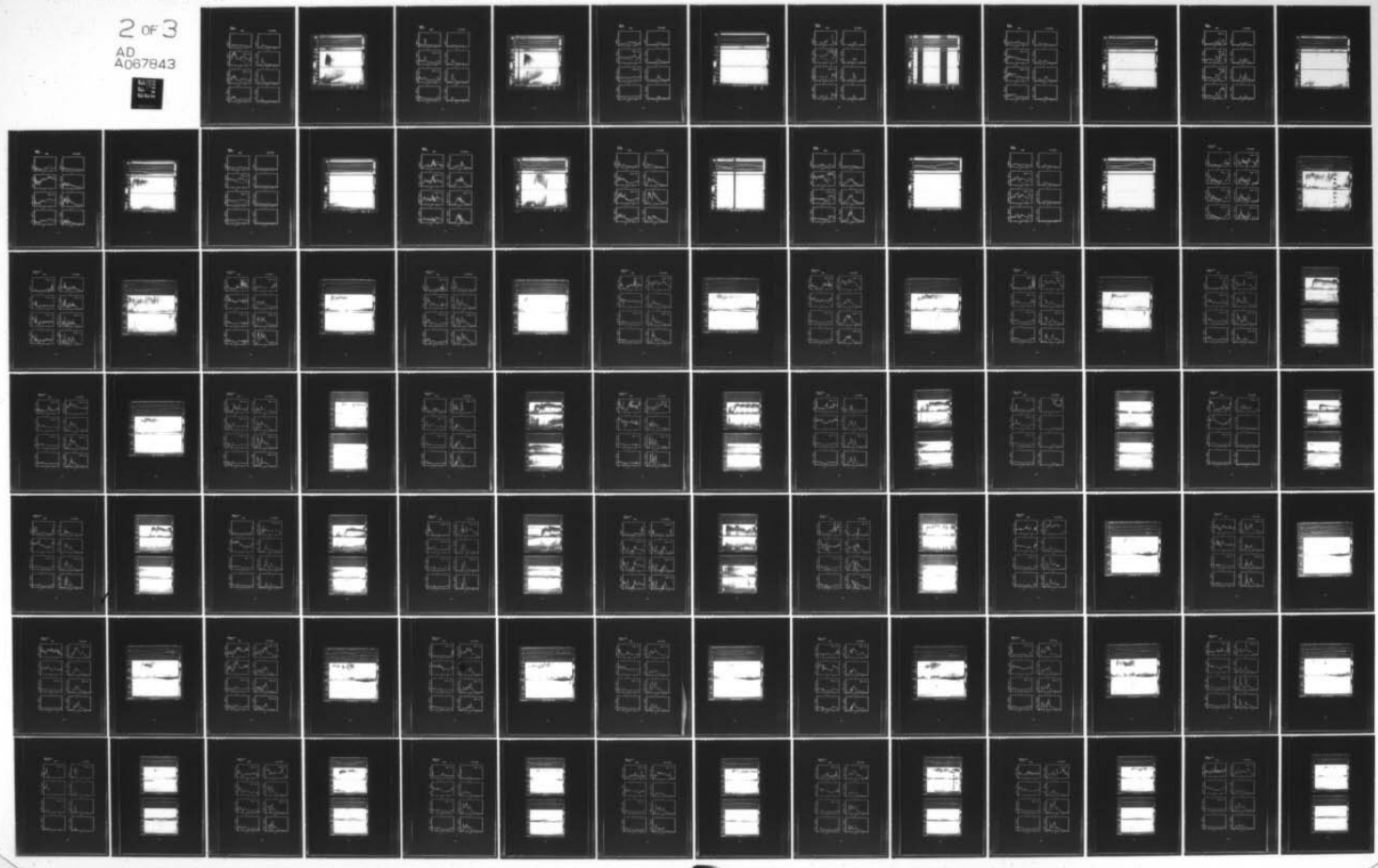
ATS-6
70/272

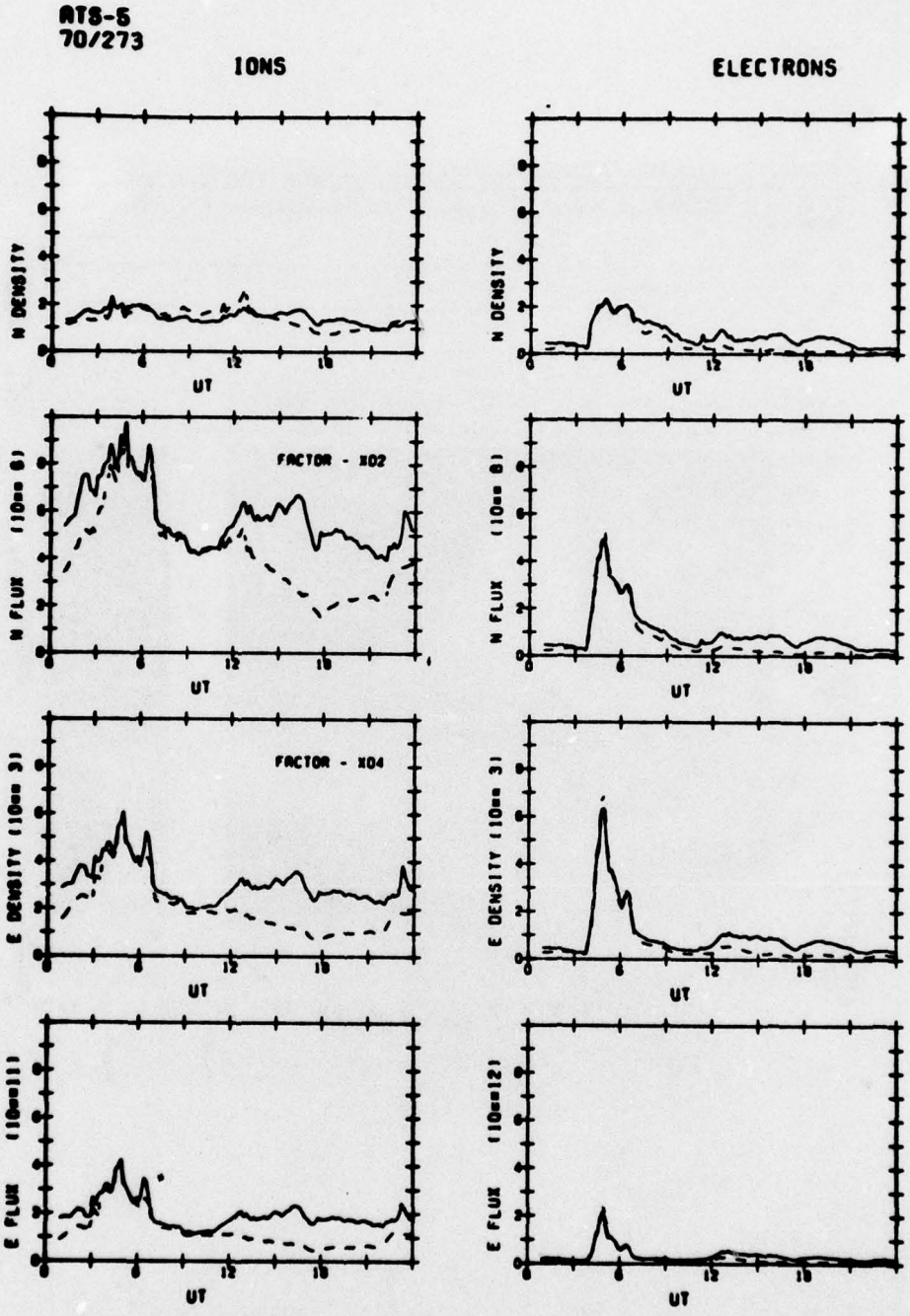

IONS
ELECTRONS
N DENSITY
UT
N FLUX (10** 6)
FACTOR - X04
E DENSITY (10** 3)
E FLUX (10**11)
E FLUX (10**12)
0
6
12
18

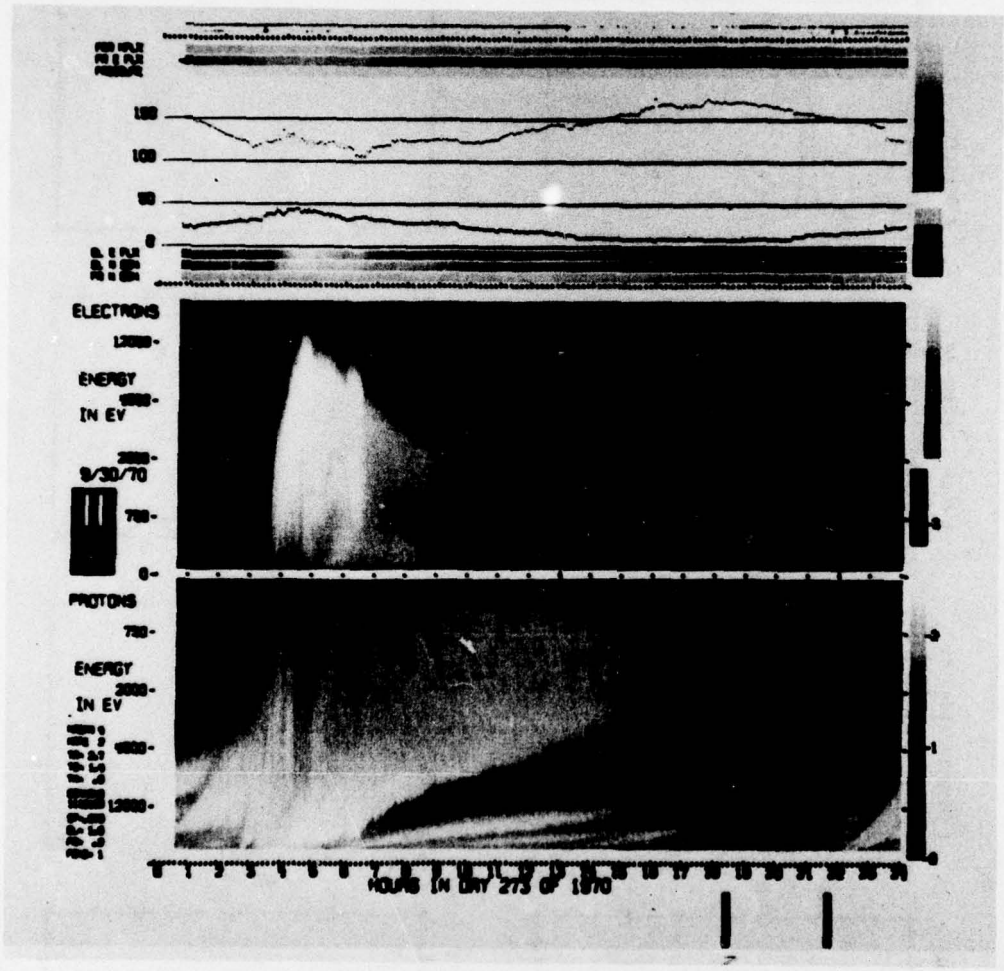

ELECTRONS
ENERGY
IN EV
9/28/70
PROTONS
ENERGY
IN EV
HOURS IN DAY 272 OF 1970

AD-A067 843 AIR FORCE GEOPHYSICS LAB HANSCOM AFB MASS F/G 4/1
MODELING OF THE GEOSYNCHRONOUS ORBIT PLASMA ENVIRONMENT. PART 3--ETC(U)
JAN 79 H B GARRETT, R E MCINERNEY
UNCLASSIFIED AFGL-TR-79-0015 NL

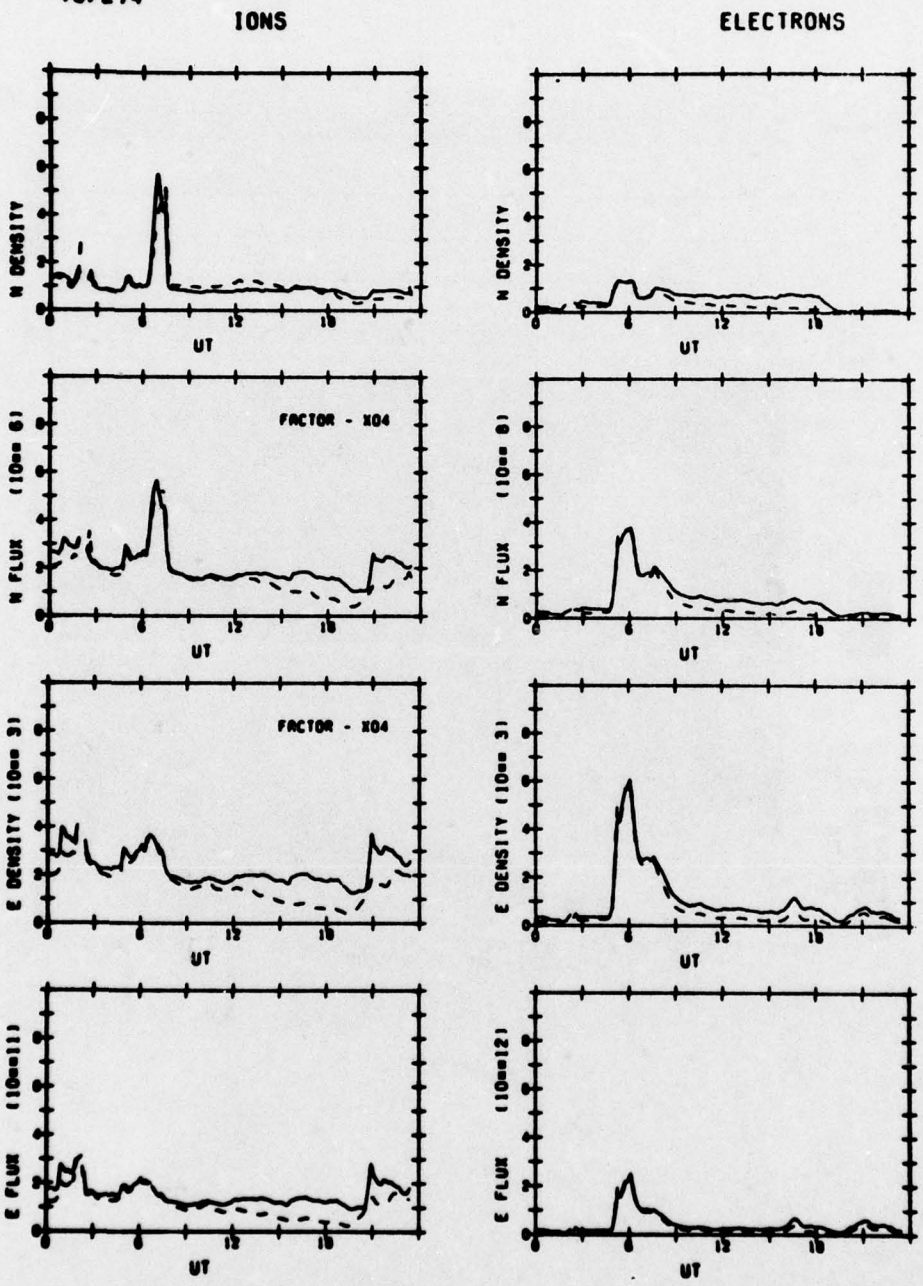
2 OF 3
AD
A067843

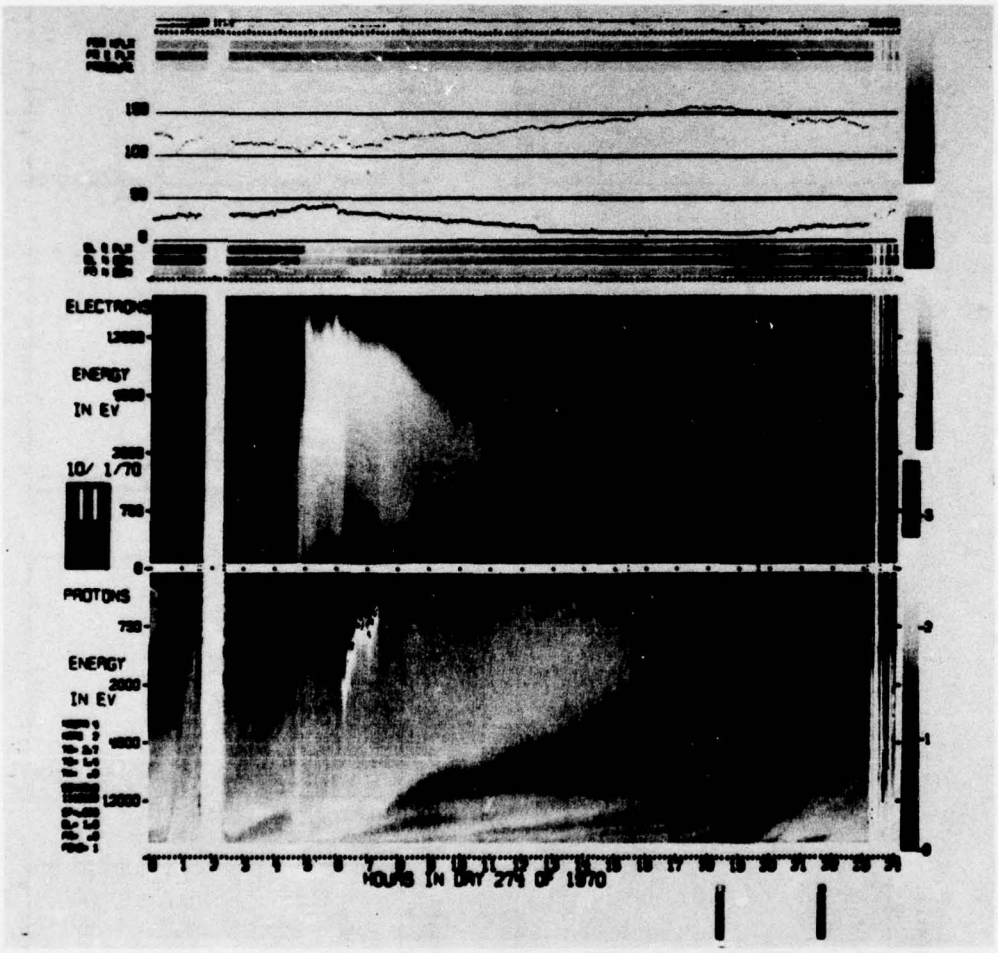



ATS-5
70/273
IONS
ELECTRONS
N DENSITY
N FLUX (10cm 6)
FACTOR - X02
E DENSITY (10cm 3)
FACTOR - X04
E FLUX (10cm11)
E FLUX (10cm12)
UT
0
6
12
18

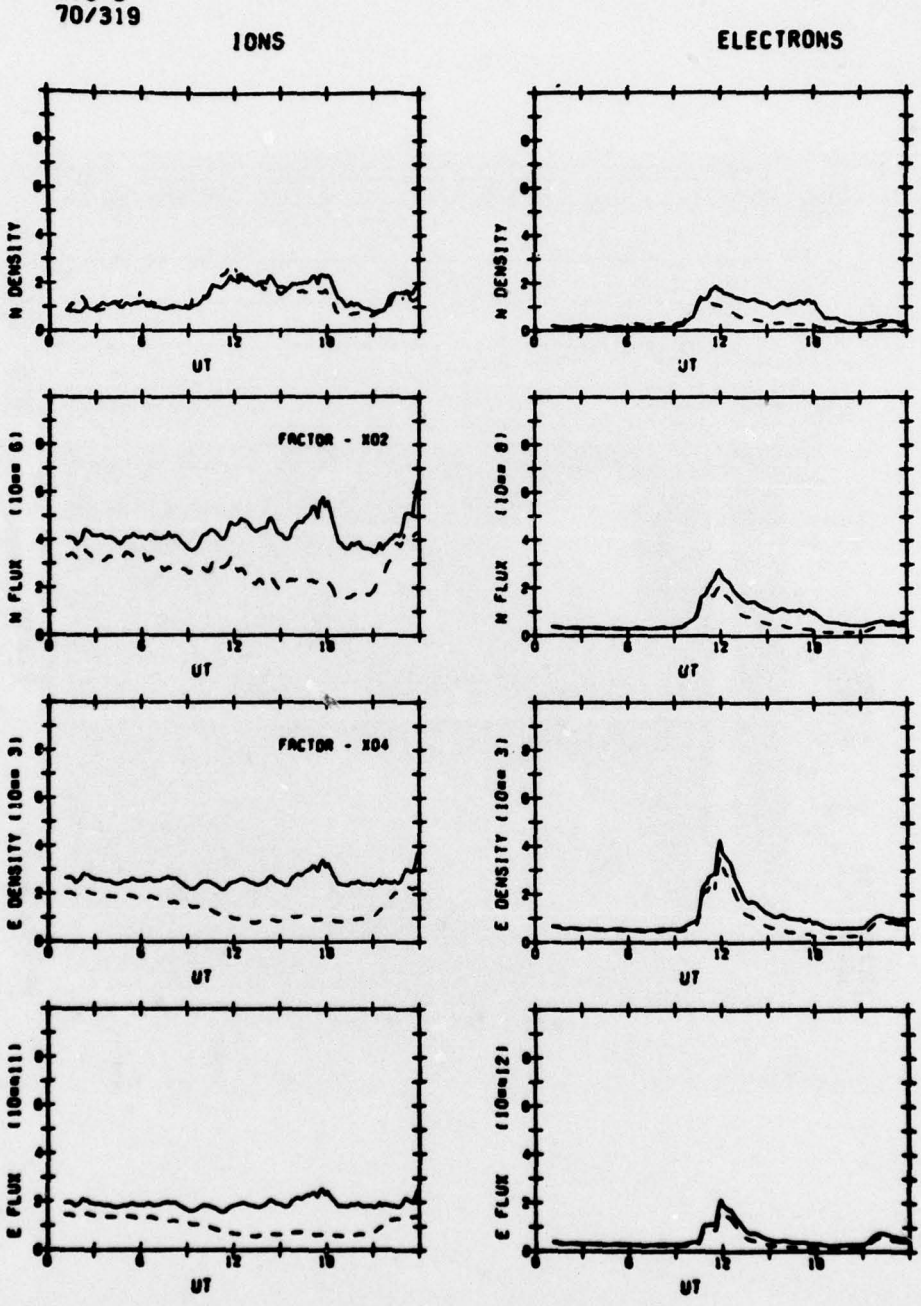

ELECTRONS
ENERGY
IN EV
9/30/70
PROTONS
ENERGY
IN EV
HOURS IN DAY 273 OF 1970

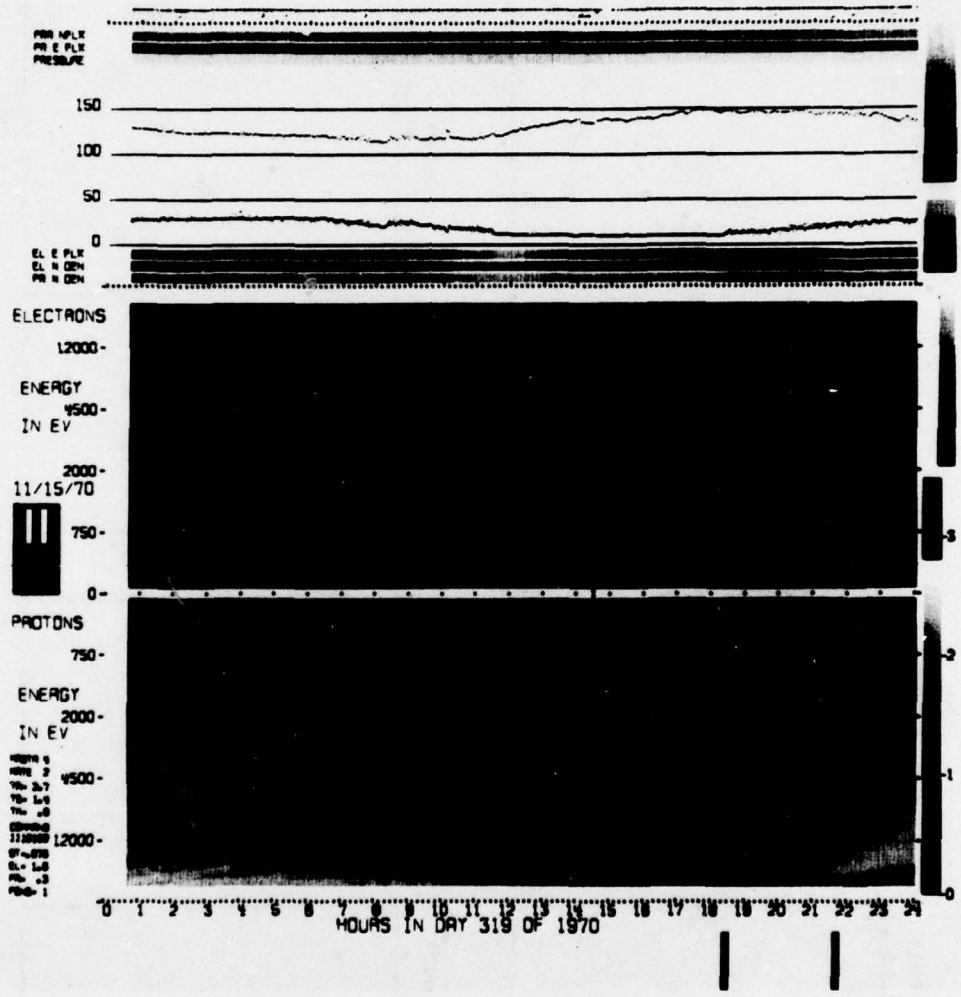
ATS-5
70/274

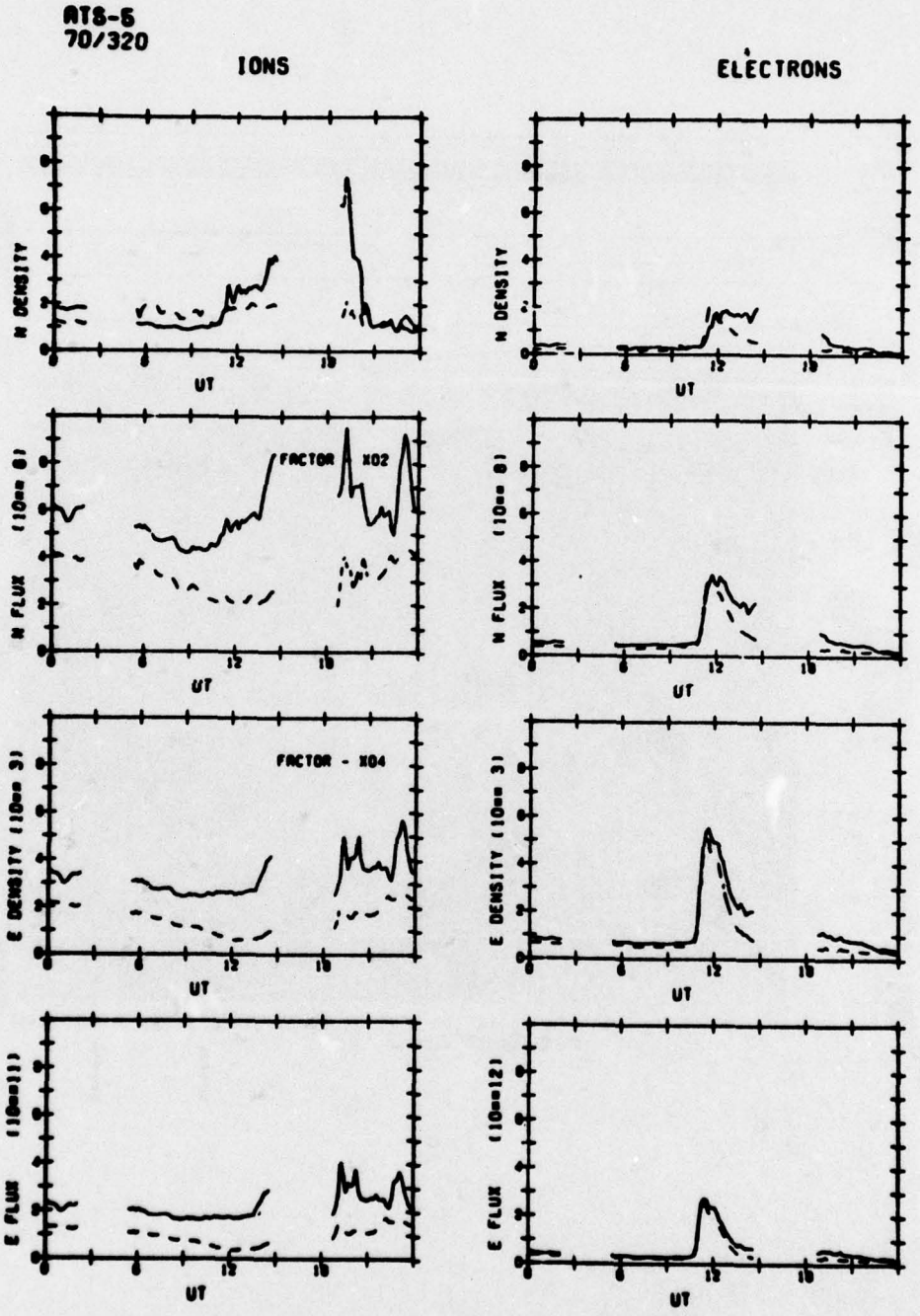

IONS
ELECTRONS
N DENSITY
N FLUX (10cm 6)
FACTOR - X04
E DENSITY (10cm 3)
FACTOR - X04
E FLUX (10cm12)
UT
0
6
12
18

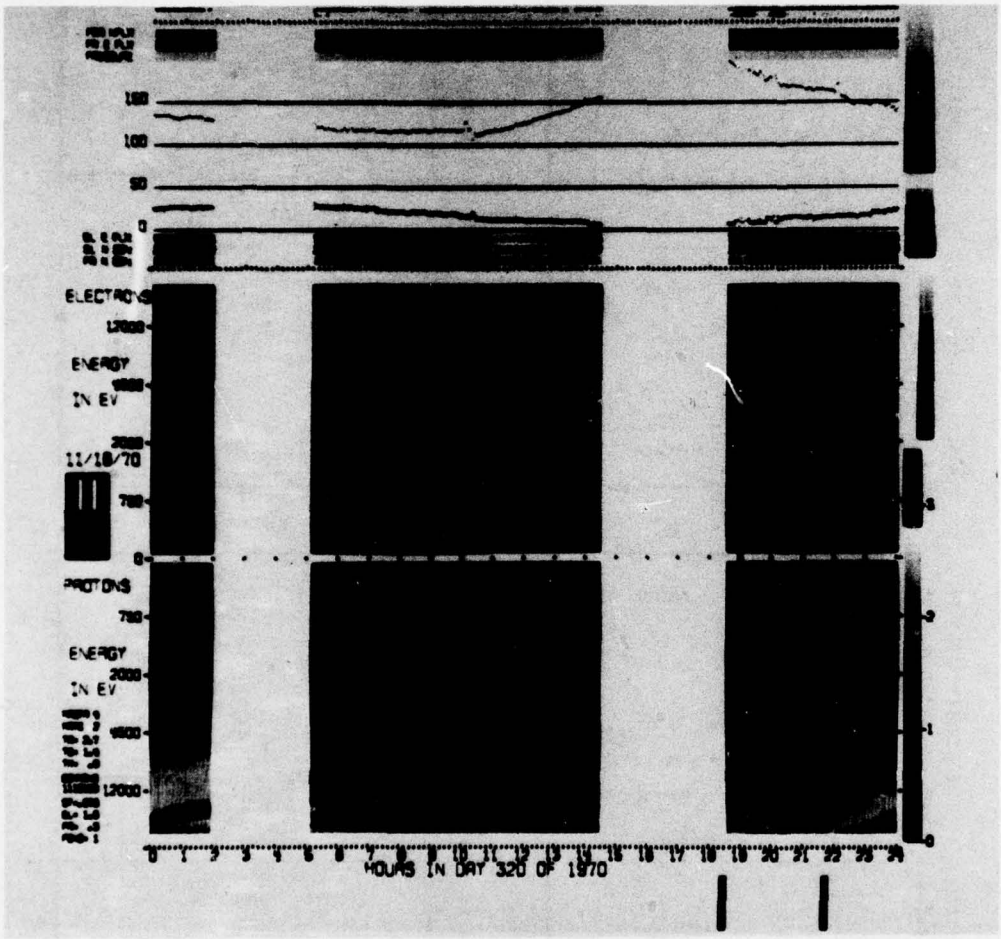

ELECTRONS
ENERGY
IN EV
10/ 1/70
PROTONS
ENERGY
IN EV
HOURS IN DAY 274 OF 1970

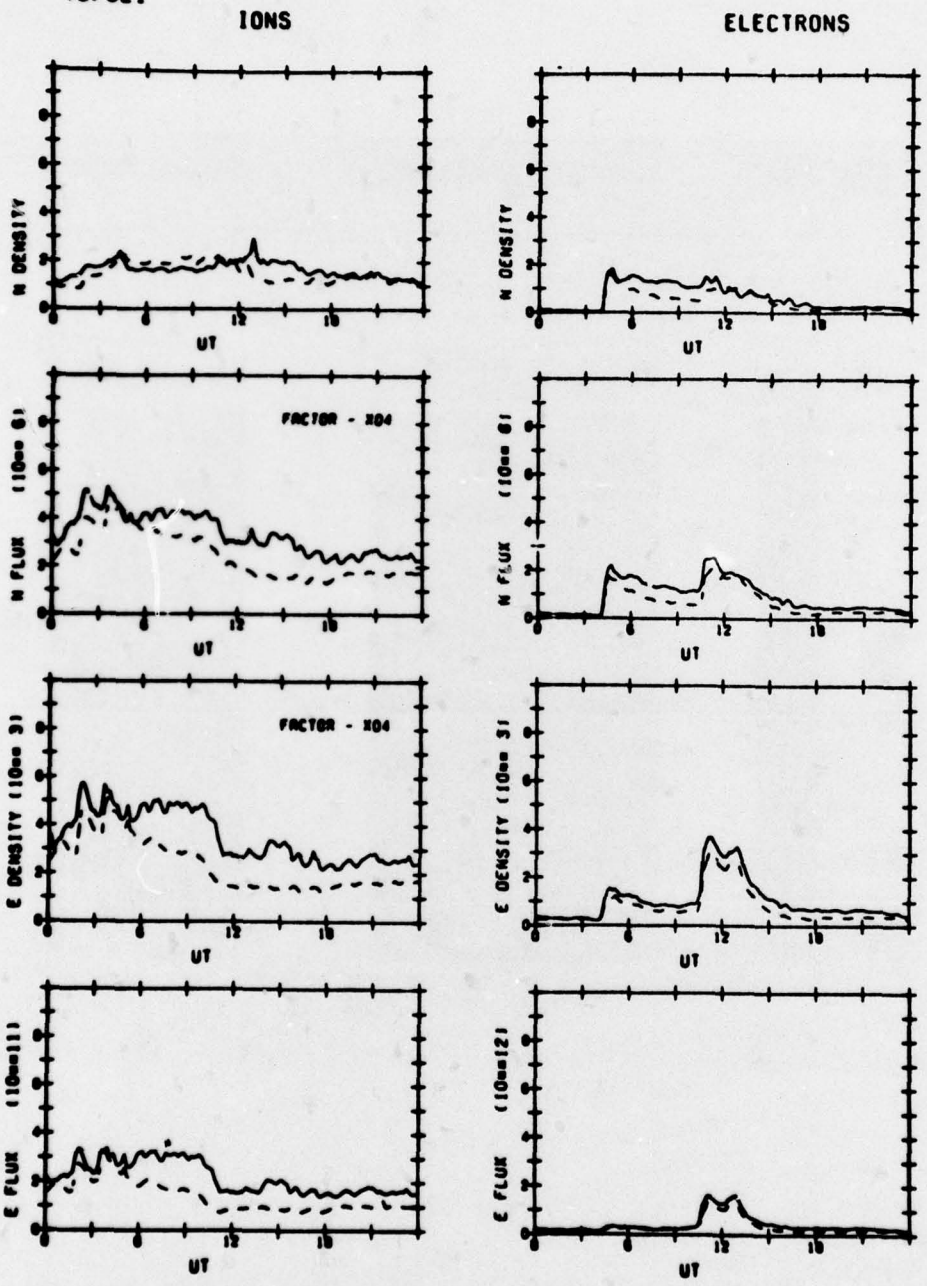
ATS-5
70/319

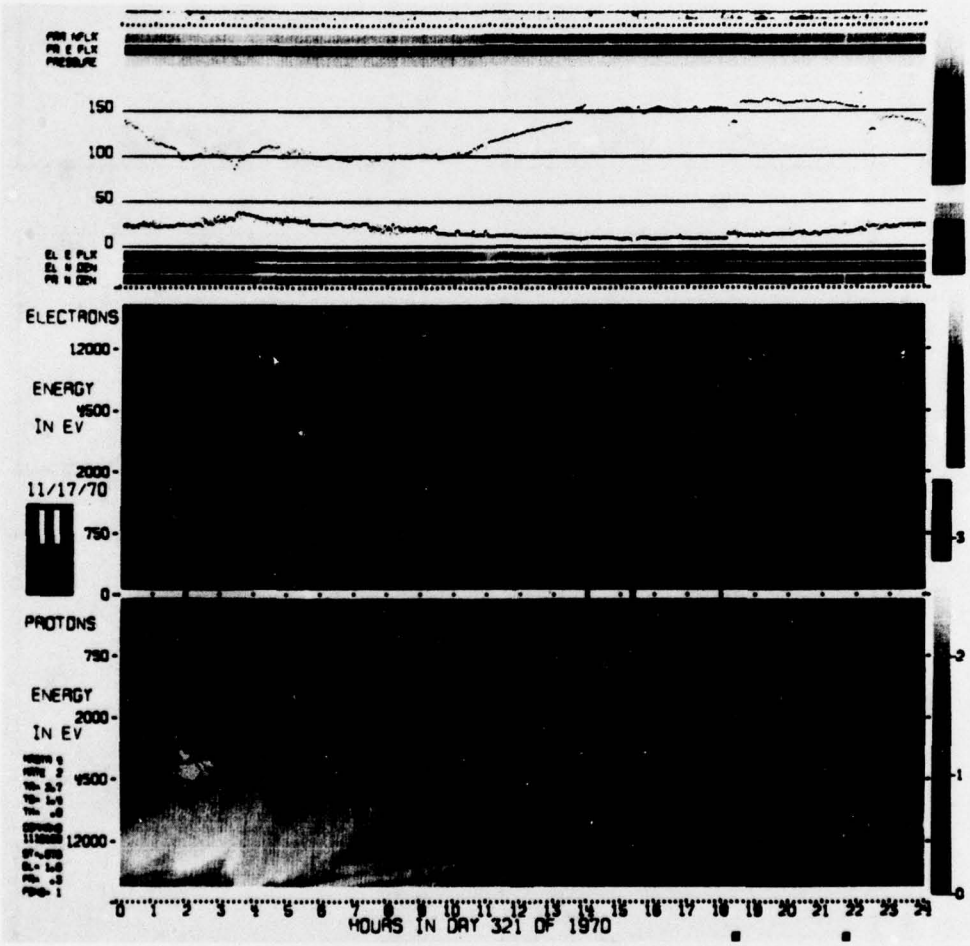

IONS
ELECTRONS
N DENSITY
N FLUX (10** 6)
FACTOR - X02
E DENSITY (10** 3)
FACTOR - X04
E FLUX (10**11)
E FLUX (10**12)
UT
0
6
12
18

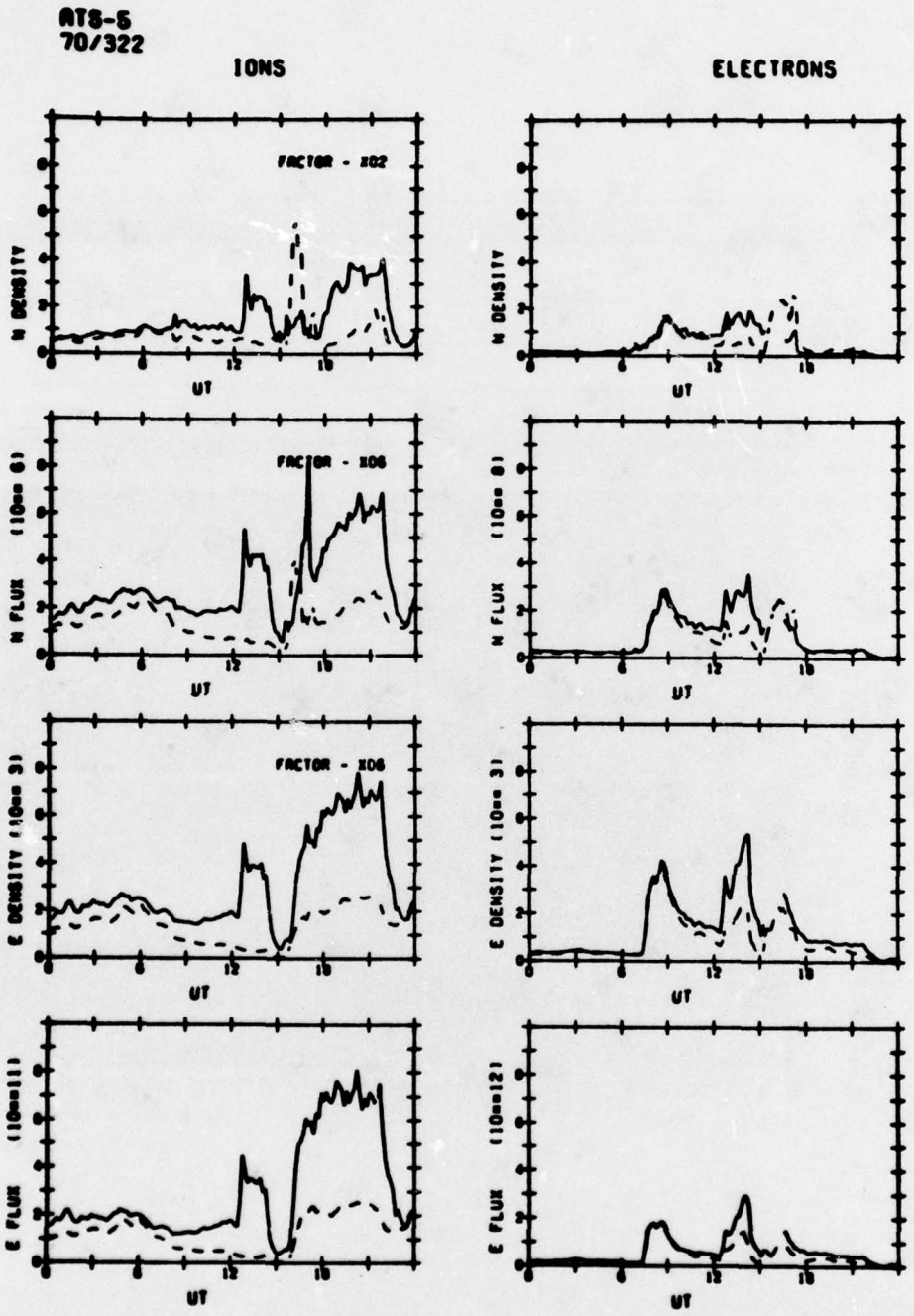

150
100
50
0
ELECTRONS
12000-
ENERGY
4500-
IN EV
2000-
11/15/70
750-
0-
PROTONS
750-
ENERGY
2000-
IN EV
4500-
12000-
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24
HOURS IN DAY 319 OF 1970

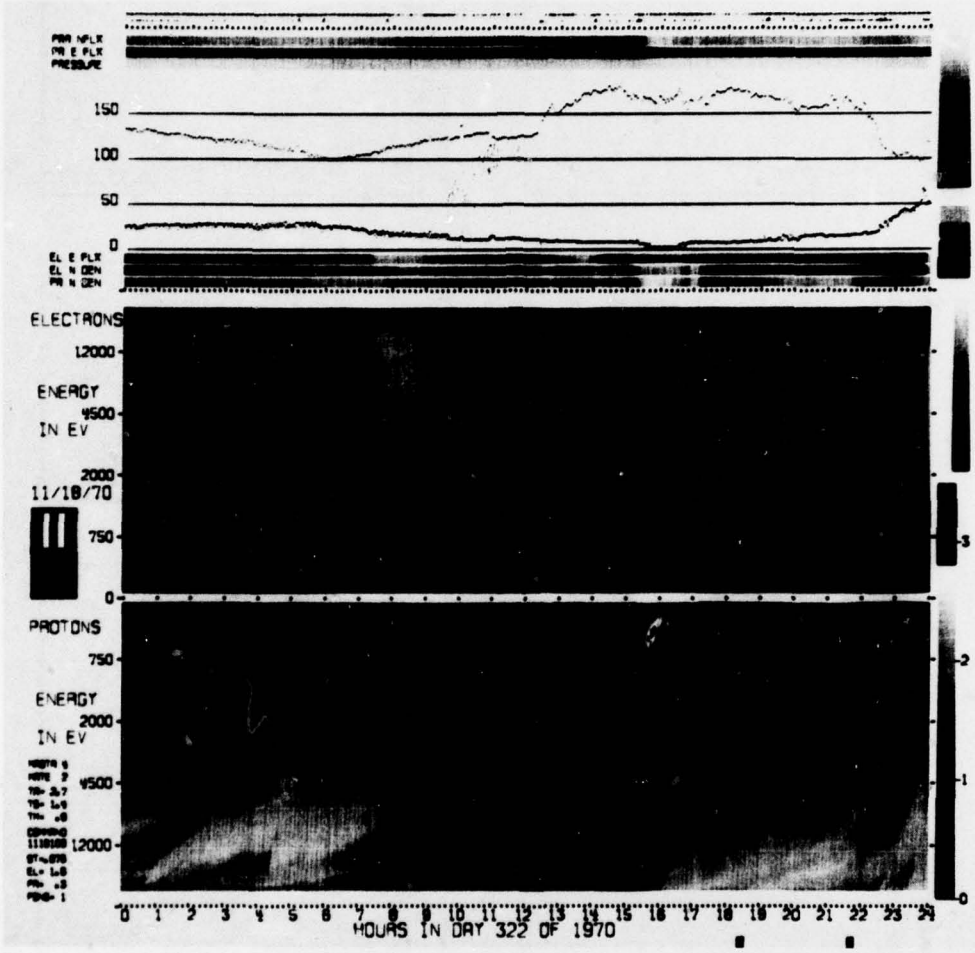

ATS-5
70/320
IONS
ELECTRONS
N DENSITY
UT
N FLUX (10cm 8)
FACTOR X02
E DENSITY (10cm 3)
FACTOR - X04
E FLUX (10cm12)
0
6
12
18

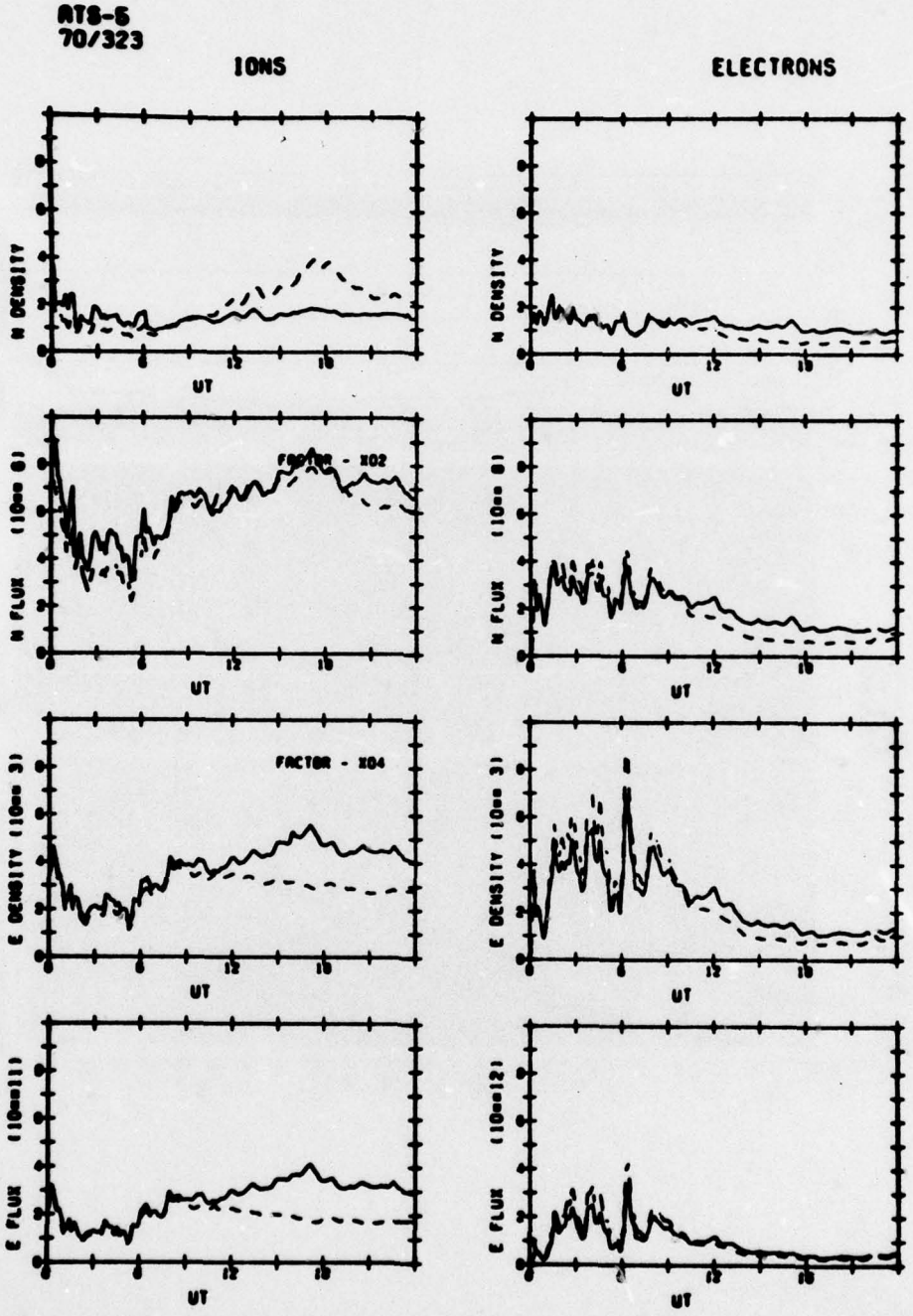

ELECTRONS
ENERGY
IN EV
11/18/70
PROTONS
ENERGY
IN EV
HOURS IN DAY 320 OF 1970

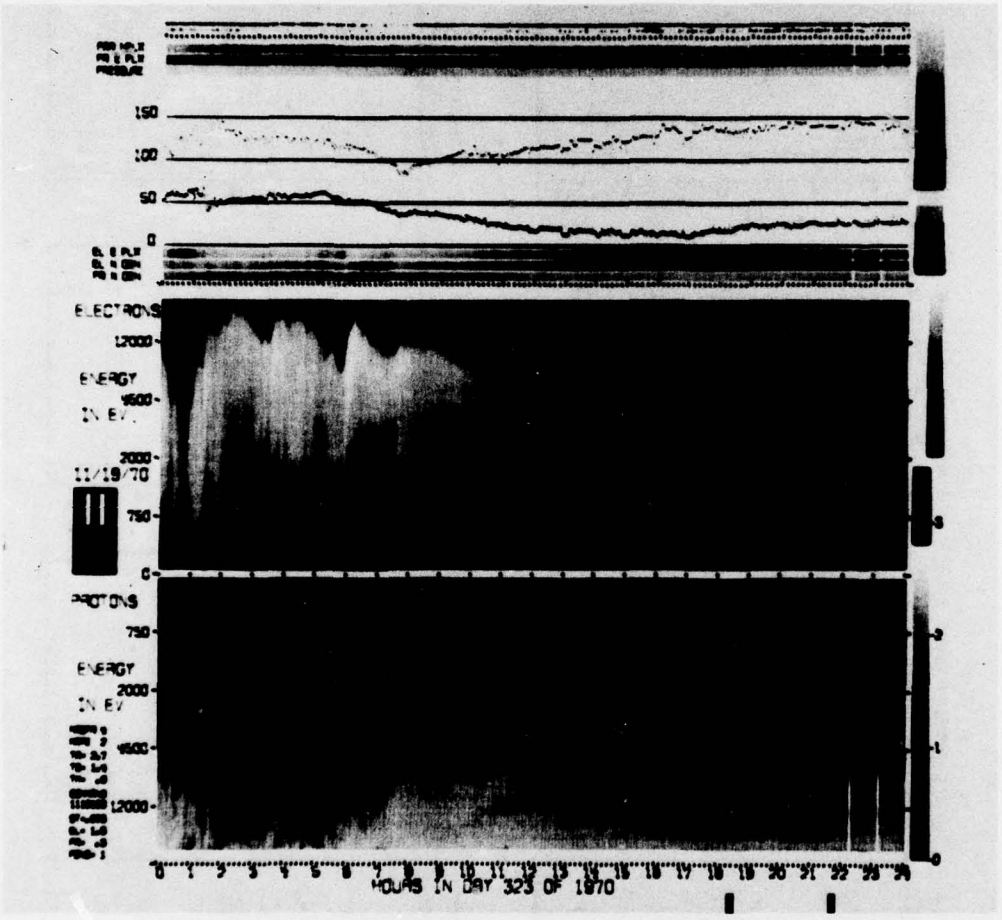

ATS-6
70/321
IONS
ELECTRONS
N DENSITY
UT
N FLUX
FACTOR - X04
E DENSITY
E FLUX
0
6
12
18

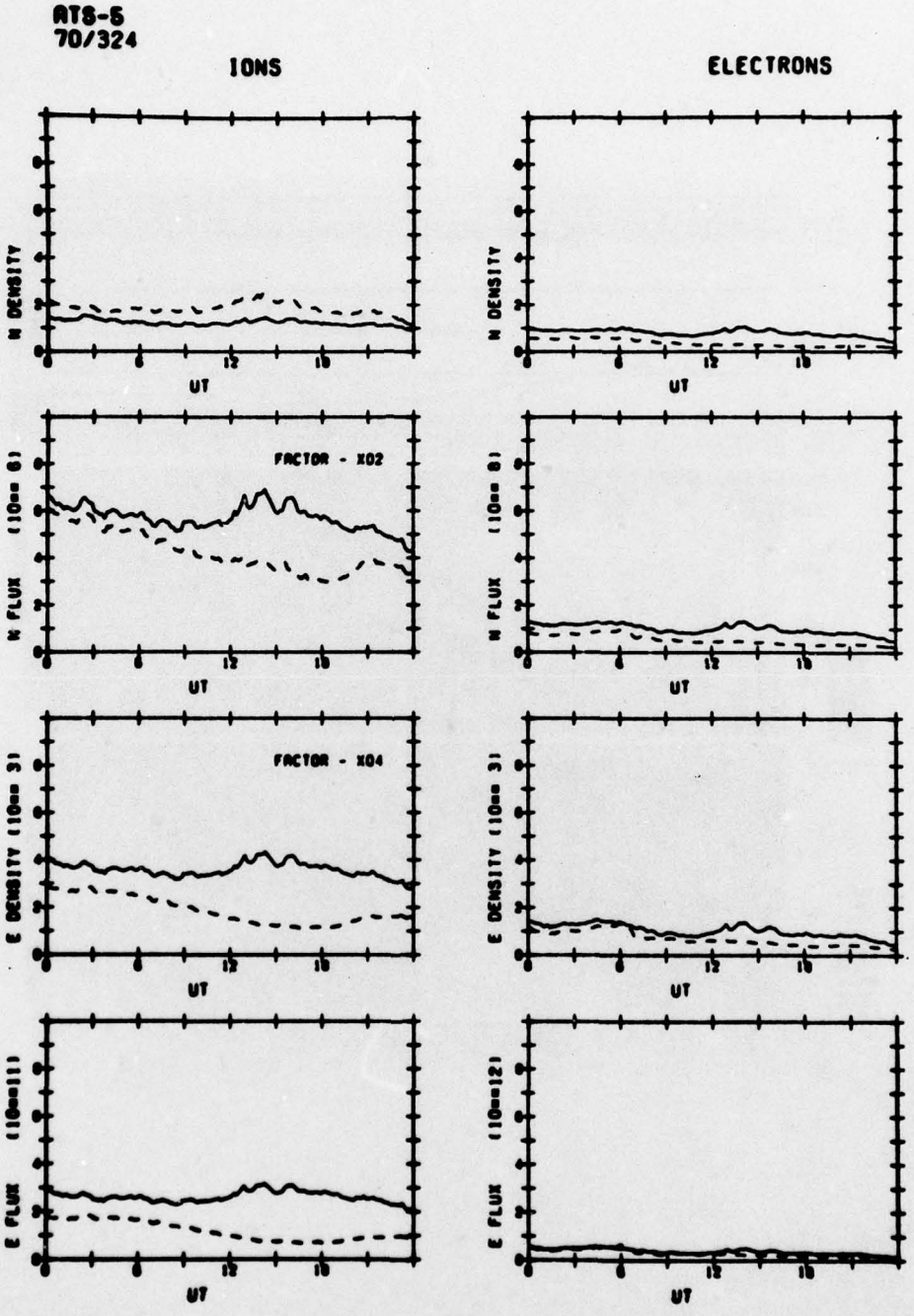

150
100
50
0
ELECTRONS
12000
ENERGY
IN EV
2000
11/17/70
750
0
PROTONS
790
ENERGY
2000
IN EV
12000
HOURS IN DAY 321 OF 1970

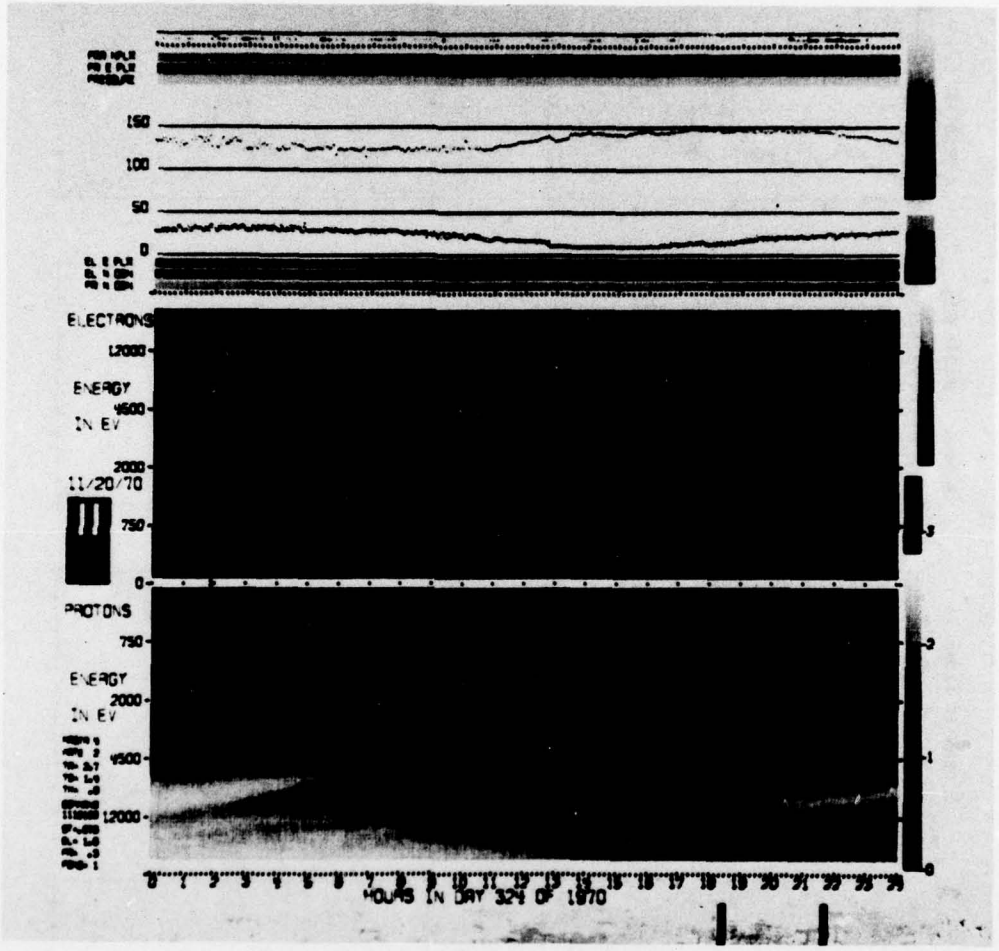

ATS-5
70/322
IONS
ELECTRONS
FACTOR - X02
N DENSITY
FACTOR - X06
N FLUX (10** 6)
FACTOR - X06
E DENSITY (10** 3)
E FLUX (10**11)
E FLUX (10**12)
UT

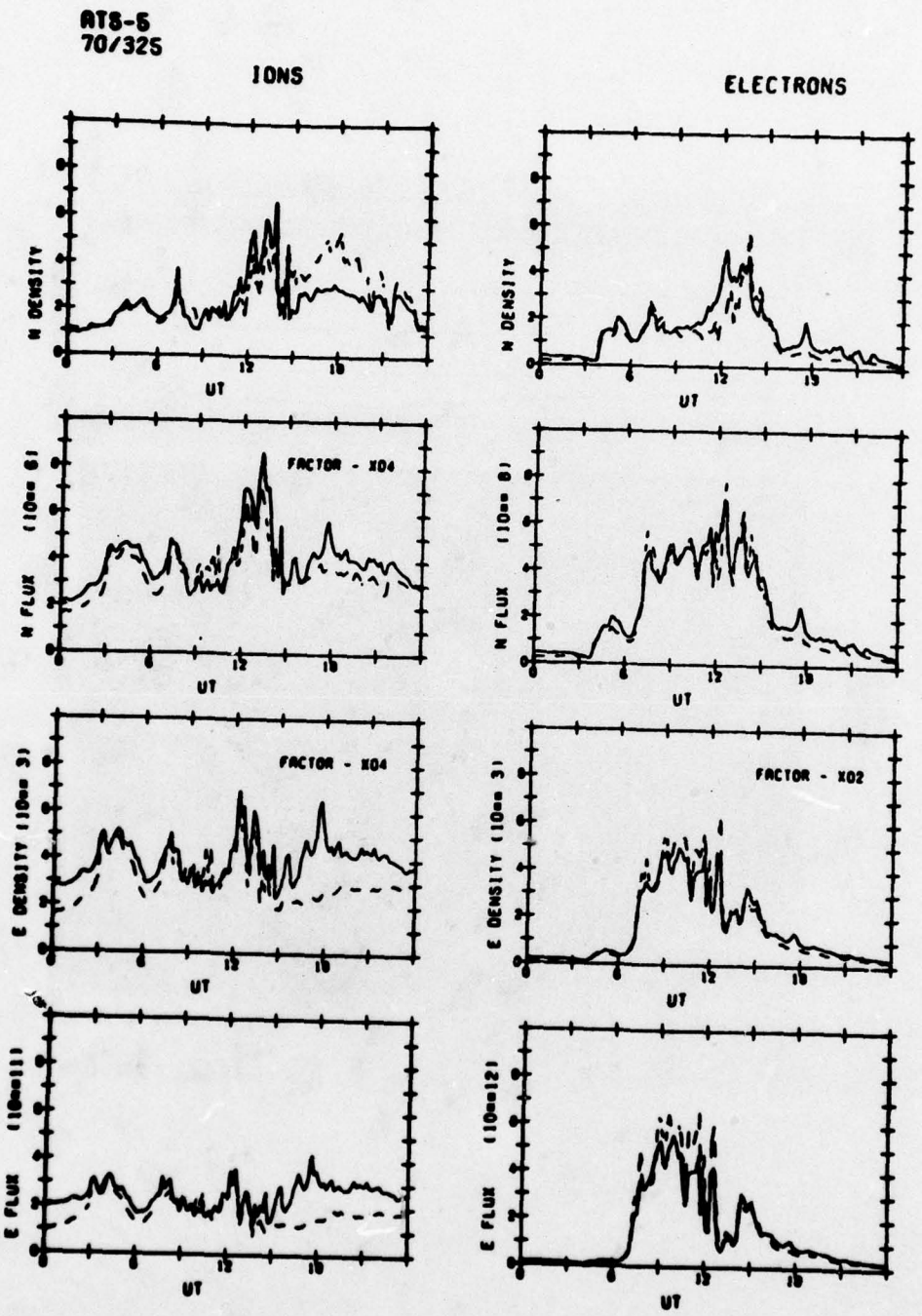

150
100
50
0
ELECTRONS
12000
ENERGY
IN EV
9500
2000
11/18/70
750
0
PROTONS
750
ENERGY
2000
IN EV
9500
12000
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24
HOURS IN DAY 322 OF 1970

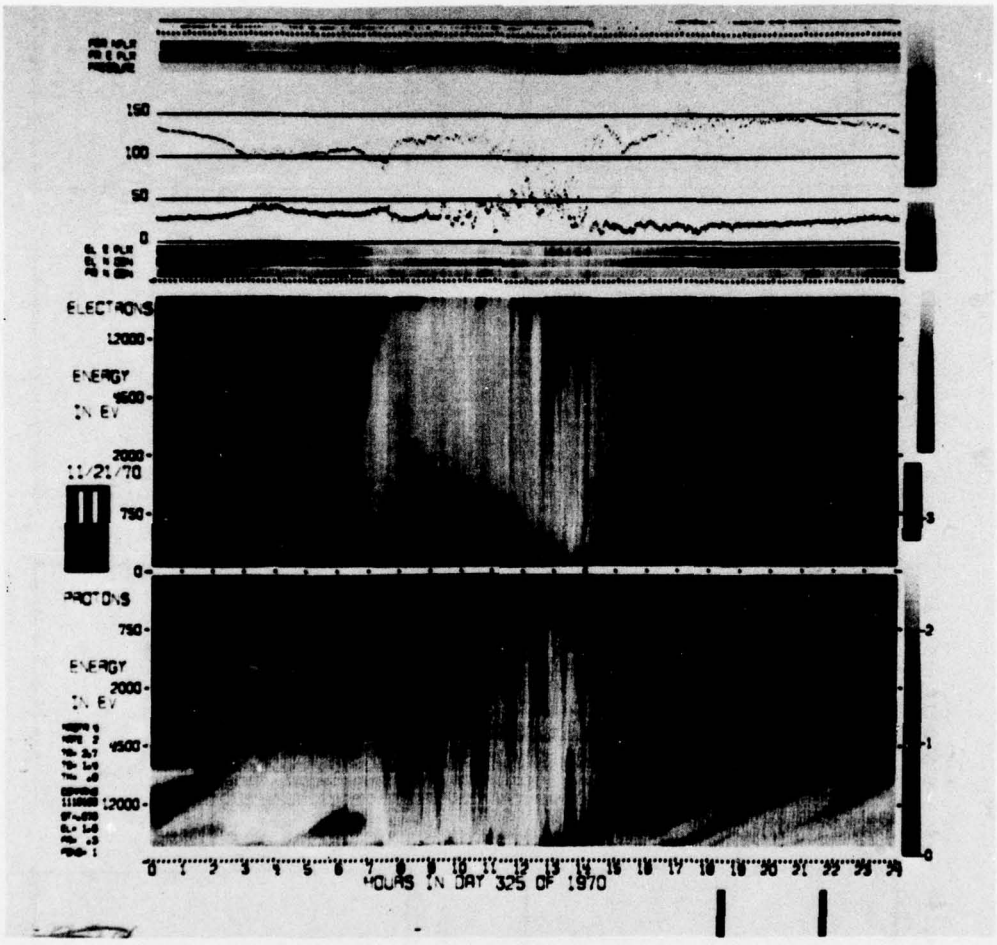

ATS-6
70/323
IONS
ELECTRONS
N DENSITY
UT
N FLUX (10** 8)
FACTOR - X02
E DENSITY (10** 3)
FACTOR - X04
E FLUX (10**11)
E FLUX (10**12)
0
6
12
18

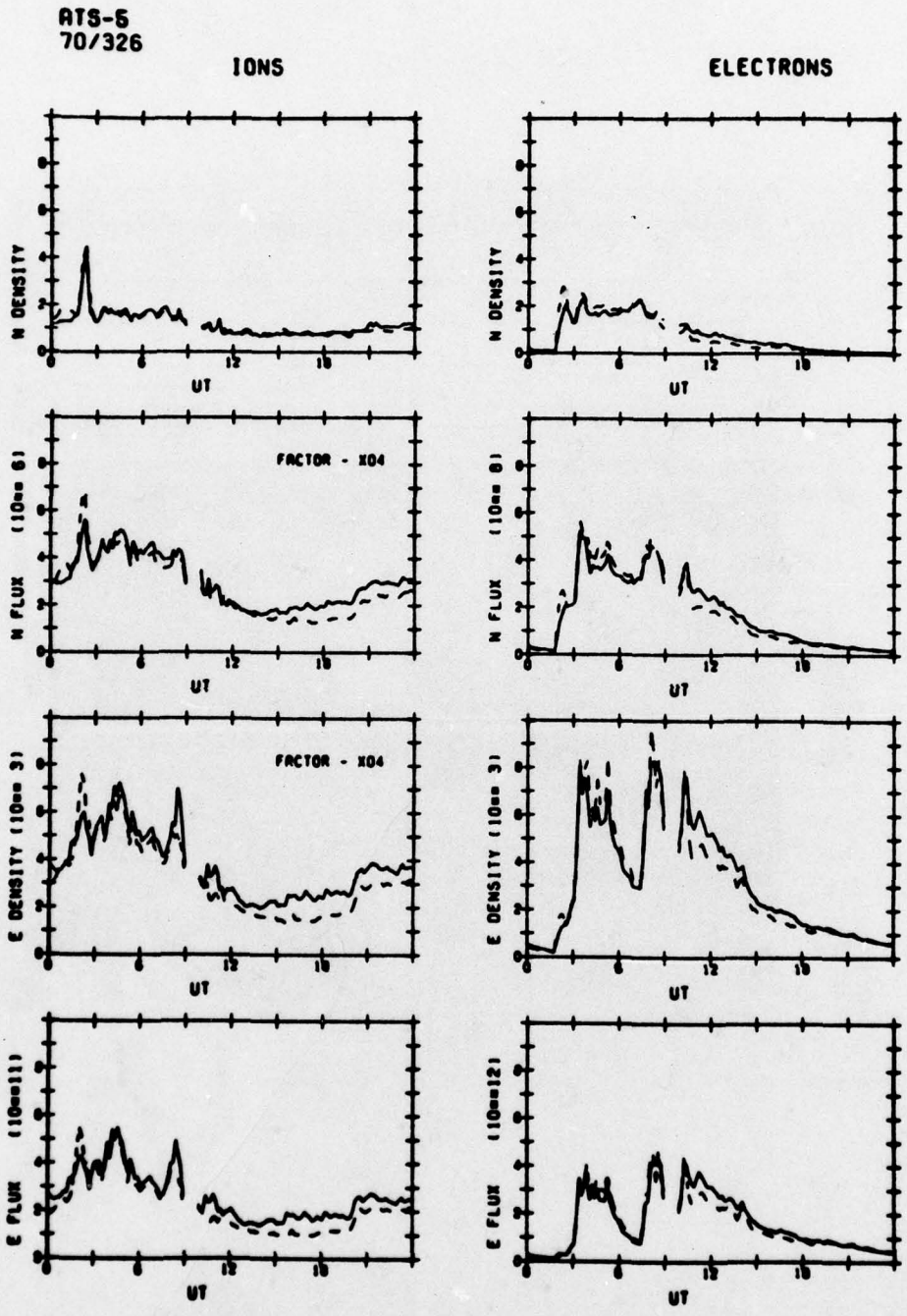

150
100
50
0
ELECTRONS
12000
ENERGY
IN EV
9600
2000
11/19/70
750
0
PROTONS
750
ENERGY
2000
IN EV
9600
12000
HOURS IN DAY 323 OF 1970

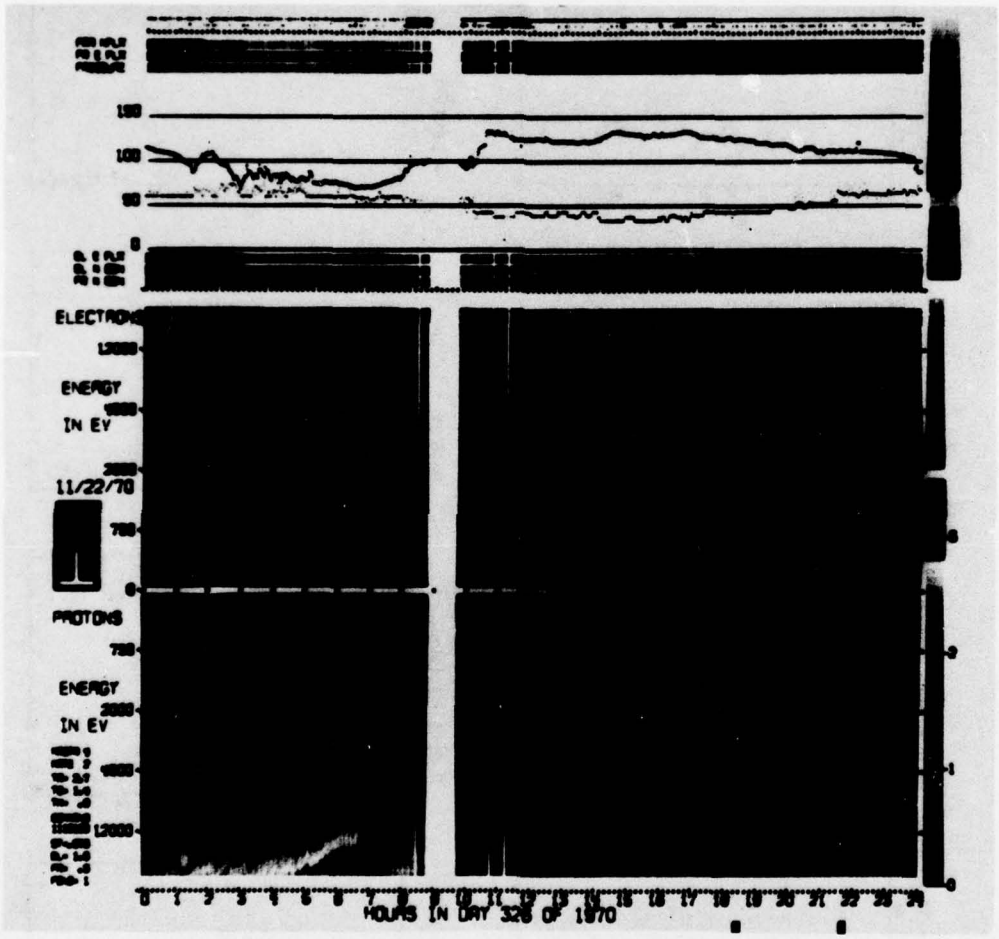

ATS-6
70/324
IONS
ELECTRONS
N DENSITY
UT
N FLUX (10cm 8)
FACTOR - X02
E DENSITY (10cm 3)
FACTOR - X04
E FLUX (10cm11)
E FLUX (10cm12)
0
6
12
18

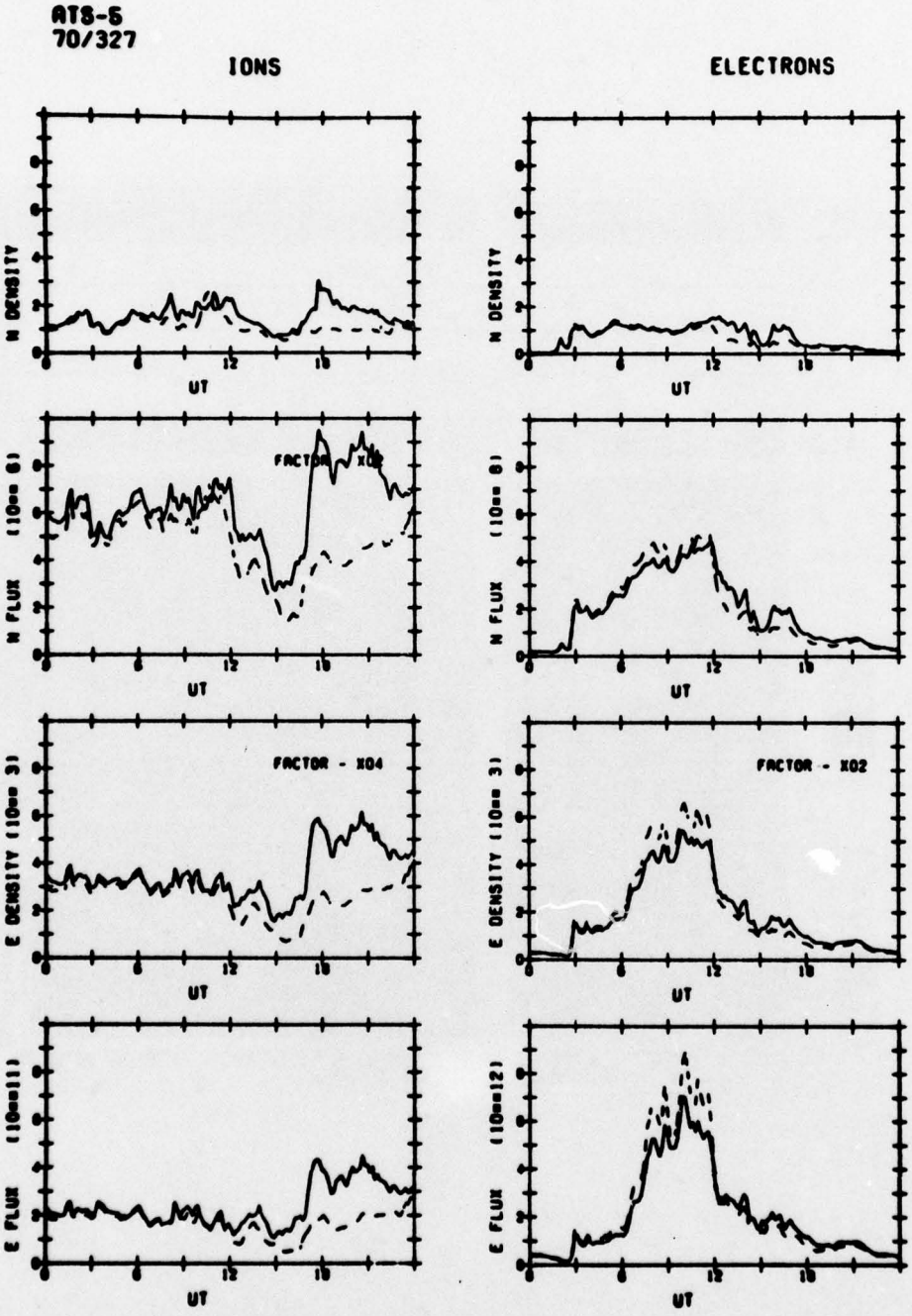

150
100
50
0
ELECTRONS
12000
ENERGY
4500
IN EV
2000
11/20/70
750
0
PROTONS
750
ENERGY
2000
IN EV
4500
12000
HOURS IN DAY 324 OF 1970

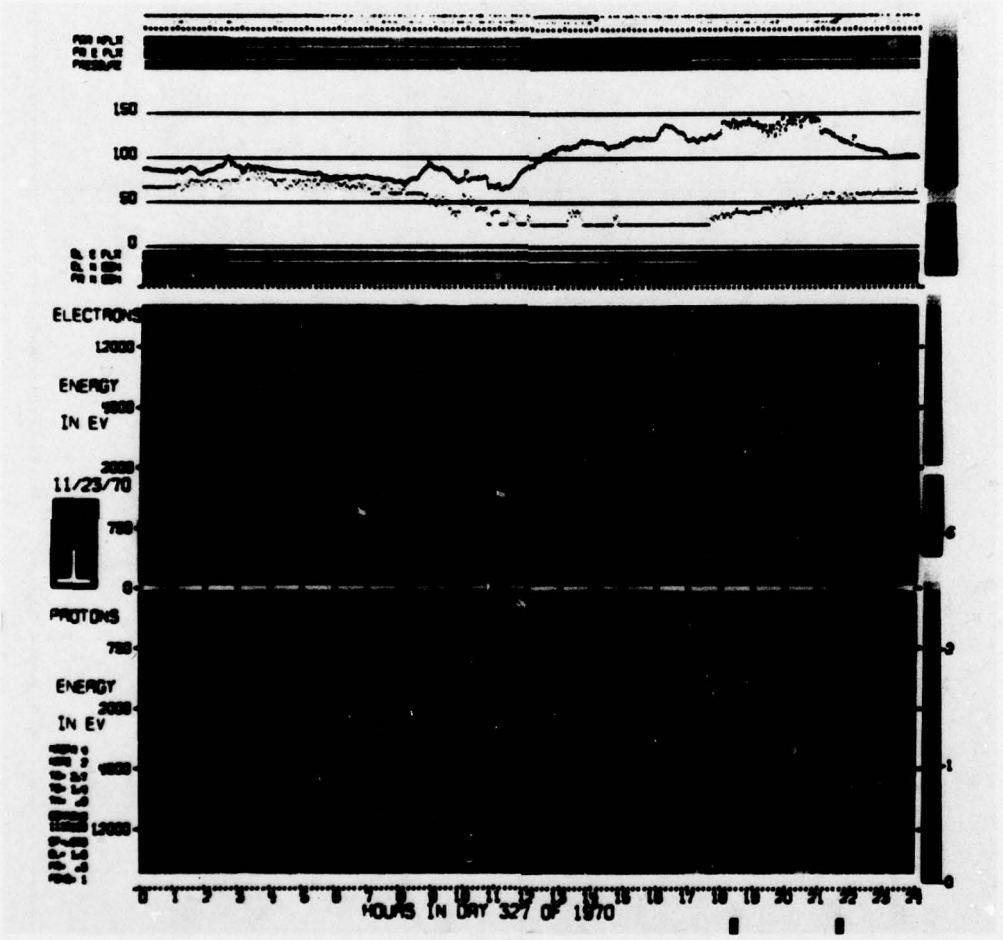

ATS-5
70/325
IONS
ELECTRONS
N DENSITY
UT
N FLUX (10** 6)
FACTOR - X04
N FLUX (10** 8)
E DENSITY (10** 3)
FACTOR - X04
FACTOR - X02
E FLUX (10**11)
E FLUX (10**12)
0
6
12
18

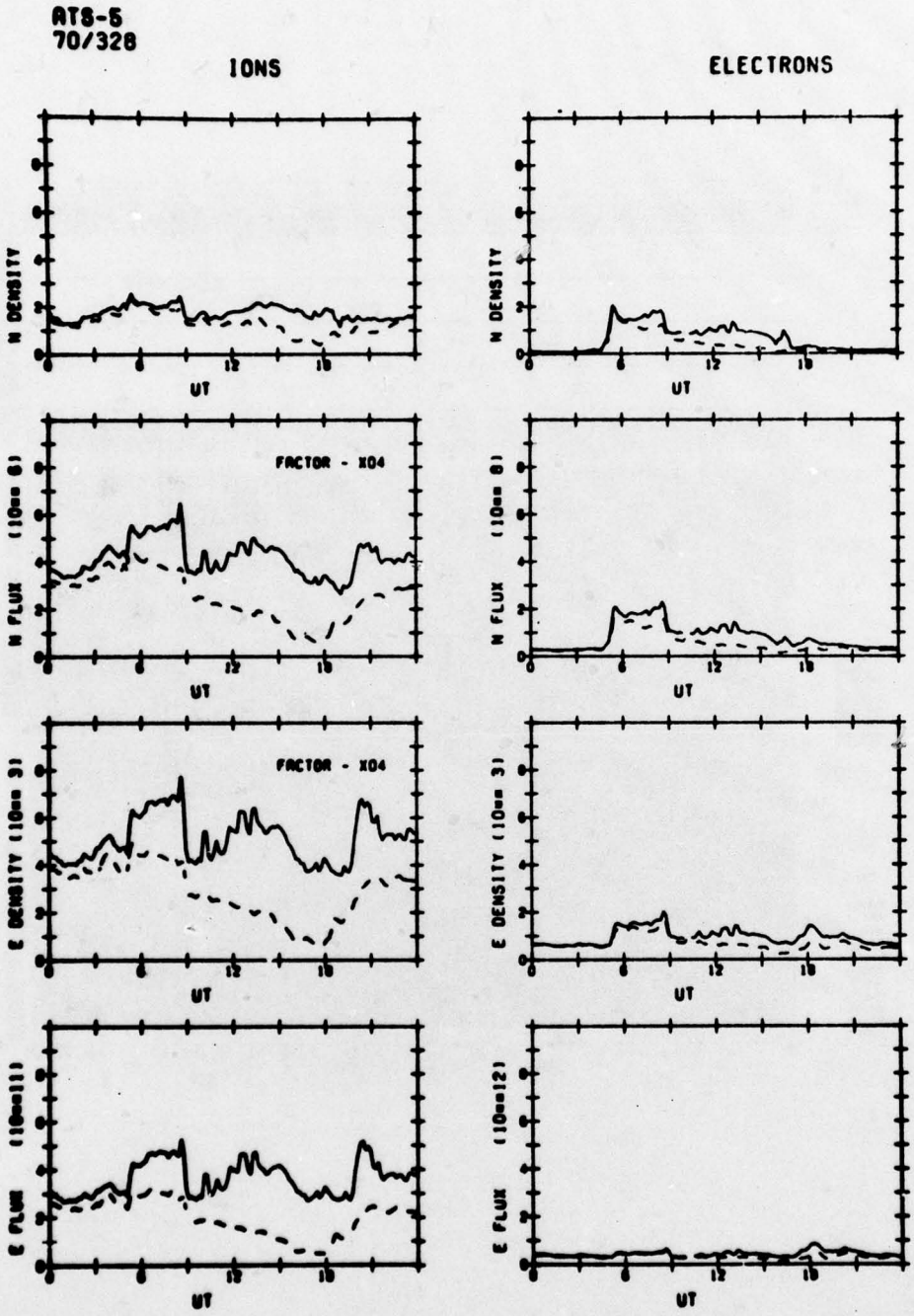

150
100
50
0
ELECTRONS
12000
ENERGY
IN EV
2000
11/21/70
750
0
PROTONS
750
ENERGY
2000
IN EV
4500
12000
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24
HOURS IN DAY 325 OF 1970
3
2
1
0

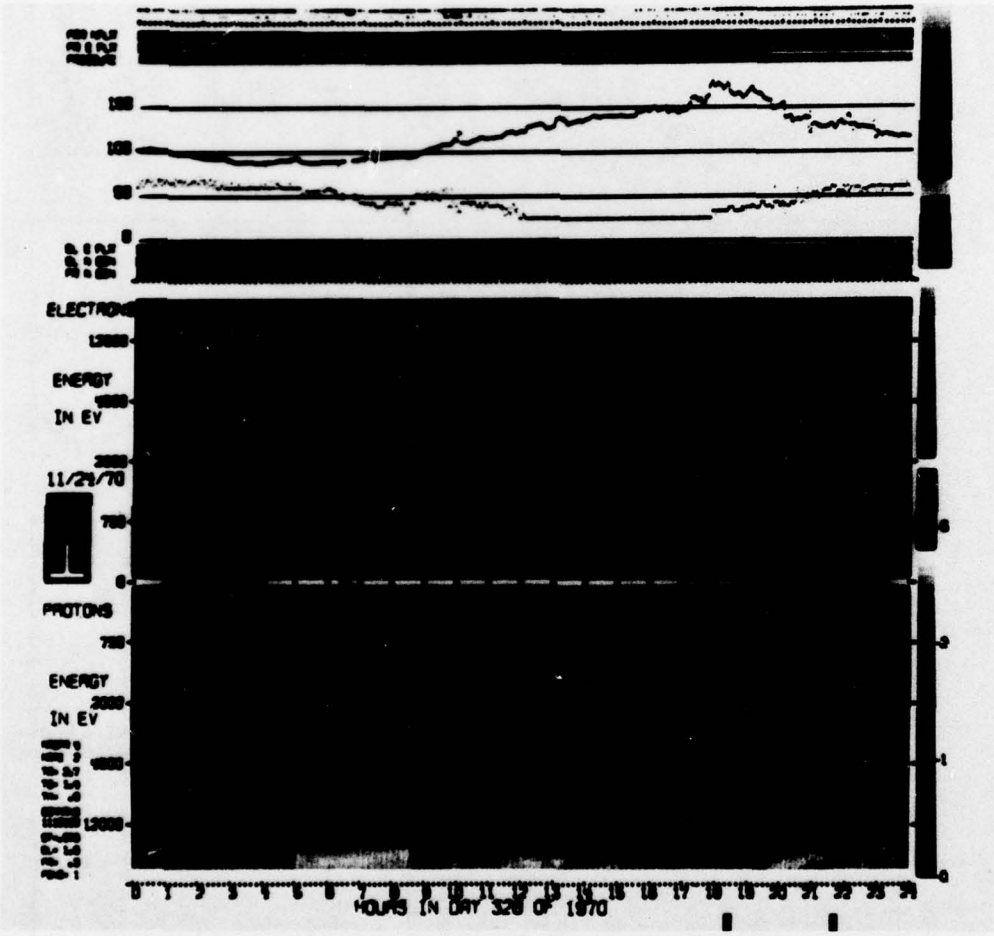

ATS-5
70/326
IONS
ELECTRONS
N DENSITY
UT
N FLUX (10** 6)
FACTOR - X04
E DENSITY (10** 3)
E FLUX (10**11)
E FLUX (10**12)


ELECTRONS
ENERGY
IN EV
11/22/70
PROTONS
ENERGY
IN EV
HOURS IN DAY 326 OF 1970

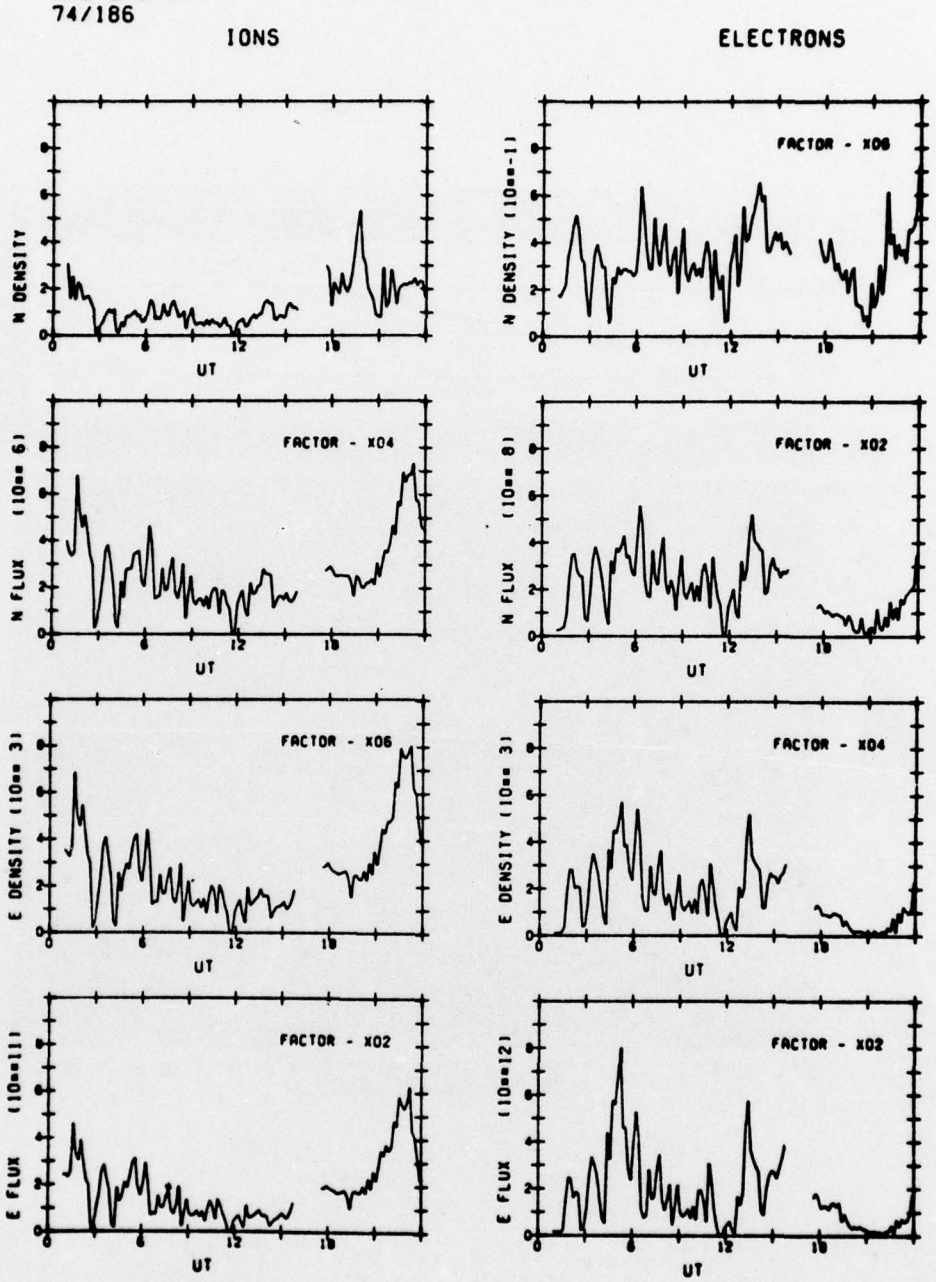

ATS-5
70/327
IONS
ELECTRONS
N DENSITY
N FLUX (10cm 8)
E DENSITY (10cm 3)
E FLUX (10cm11)
E FLUX (10cm12)
FACTOR - X04
FACTOR - X02
UT
0
6
12
18

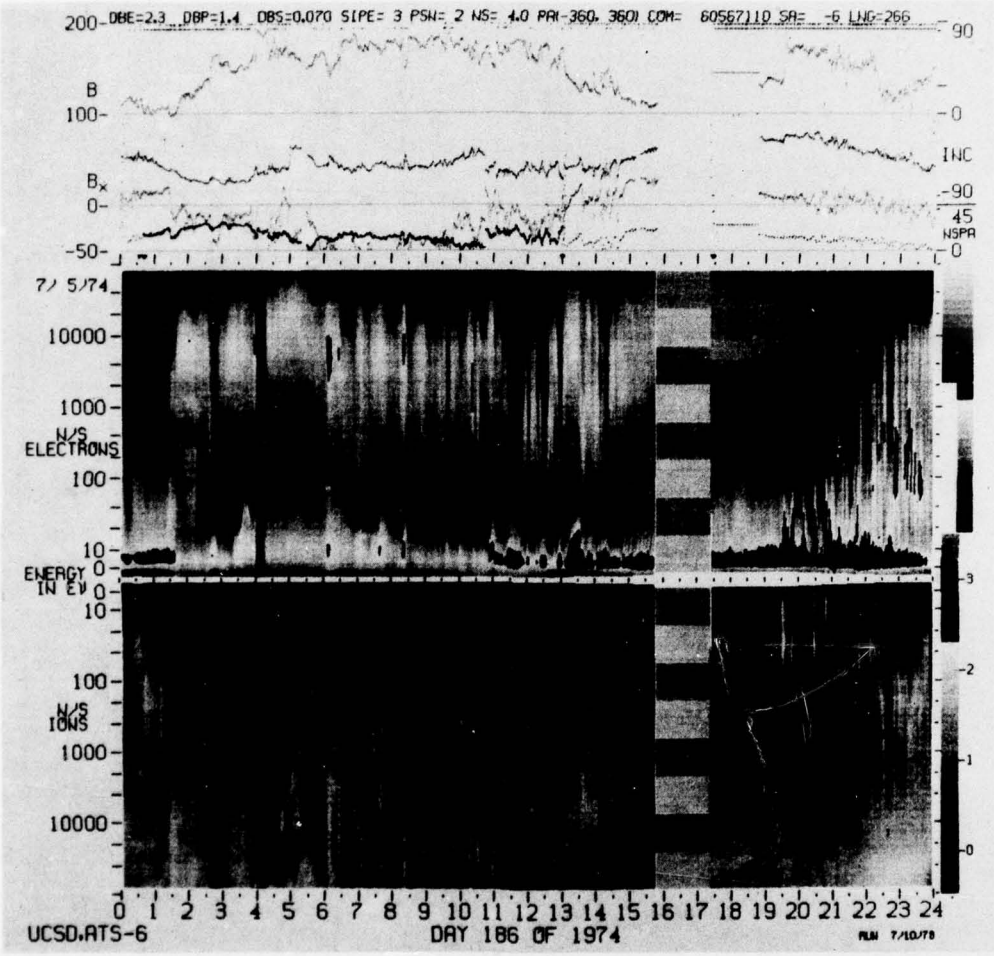

150
100
50
0
ELECTRONS
ENERGY
IN EV
11/23/70
PROTONS
ENERGY
IN EV
HOURS IN DAY 327 OF 1970


ATS-5
70/328
IONS
ELECTRONS
N DENSITY
N FLUX (10=8)
FACTOR - X04
E DENSITY (10=3)
FACTOR - X04
E FLUX (10=11)
E FLUX (10=12)
UT
0
6
12
18


ELECTRONS
ENERGY
IN EV
11/24/70
PROTONS
ENERGY
IN EV
HOURS IN DAY 328 OF 1970

ATS-6 DATA
74/186

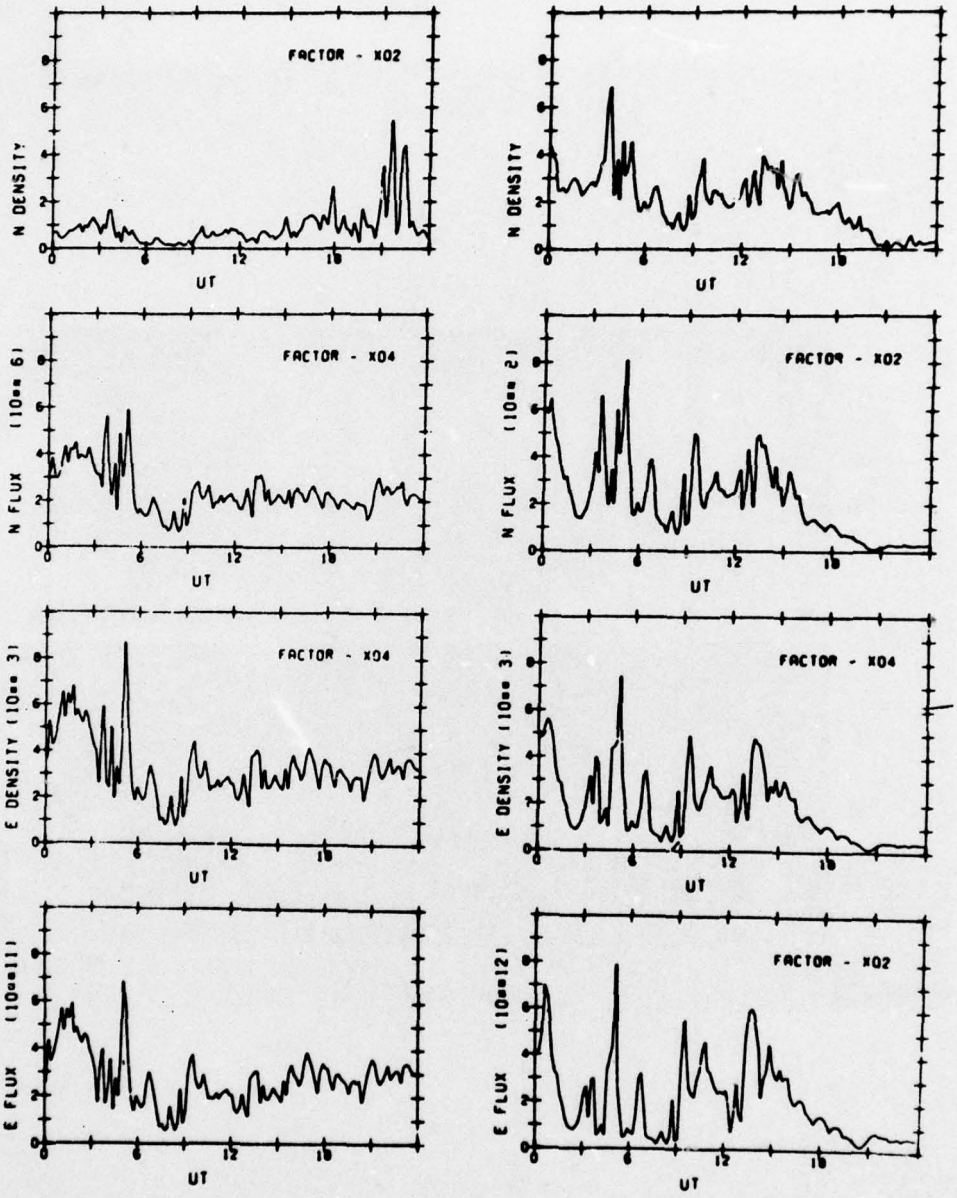


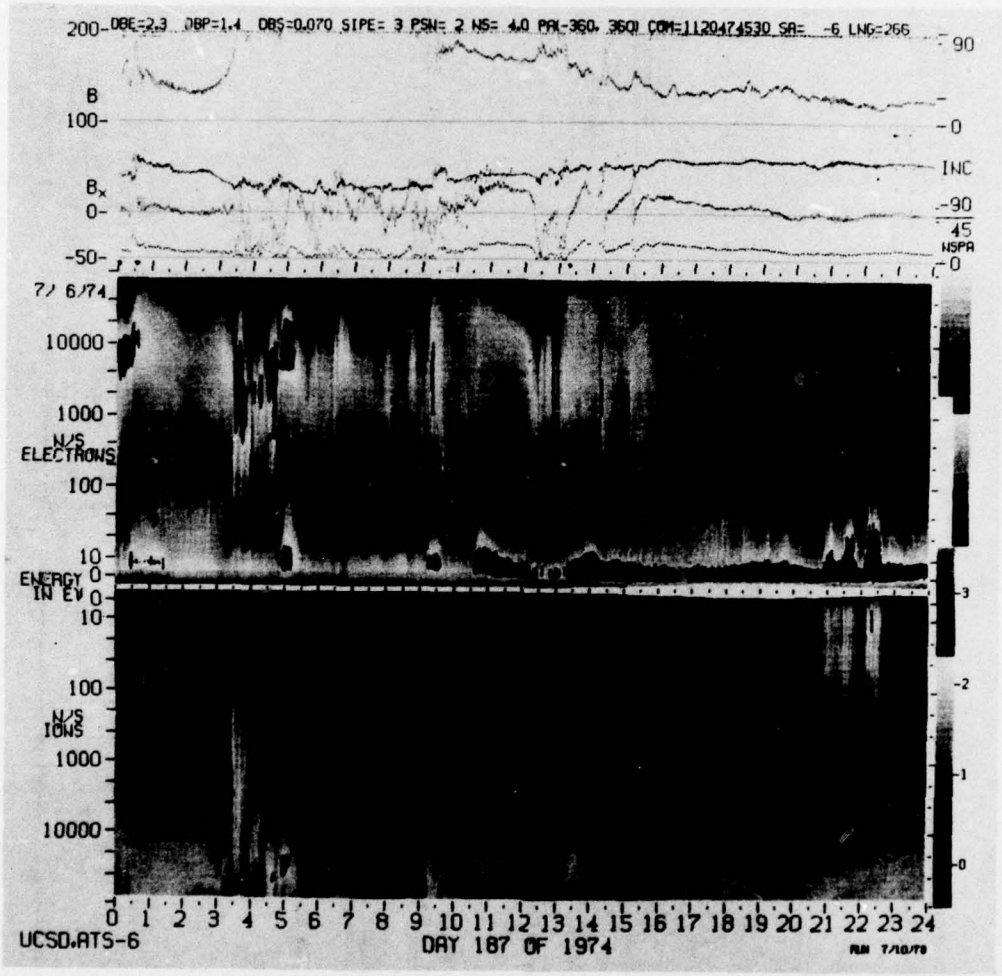

DBE=2.3 DBP=1.4 DBS=0.070 SIPE= 3 PSW= 2 NS= 4.0 PAR-360. 360 COM= 60567110 SA= -6 LWC=266
200
B
100
Bx
0
-50
90
0
INC
-90
45
NSPA
0
7/ 5/74
10000
1000
N/S
ELECTRONS
100
10
ENERGY 0
IN EV 0
10
100
N/S
IONS
1000
10000
3
2
1
0
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24
UCSD.ATS-6
DAY 186 OF 1974
PLM 7/10/78

ATS-6 DATA
74/187

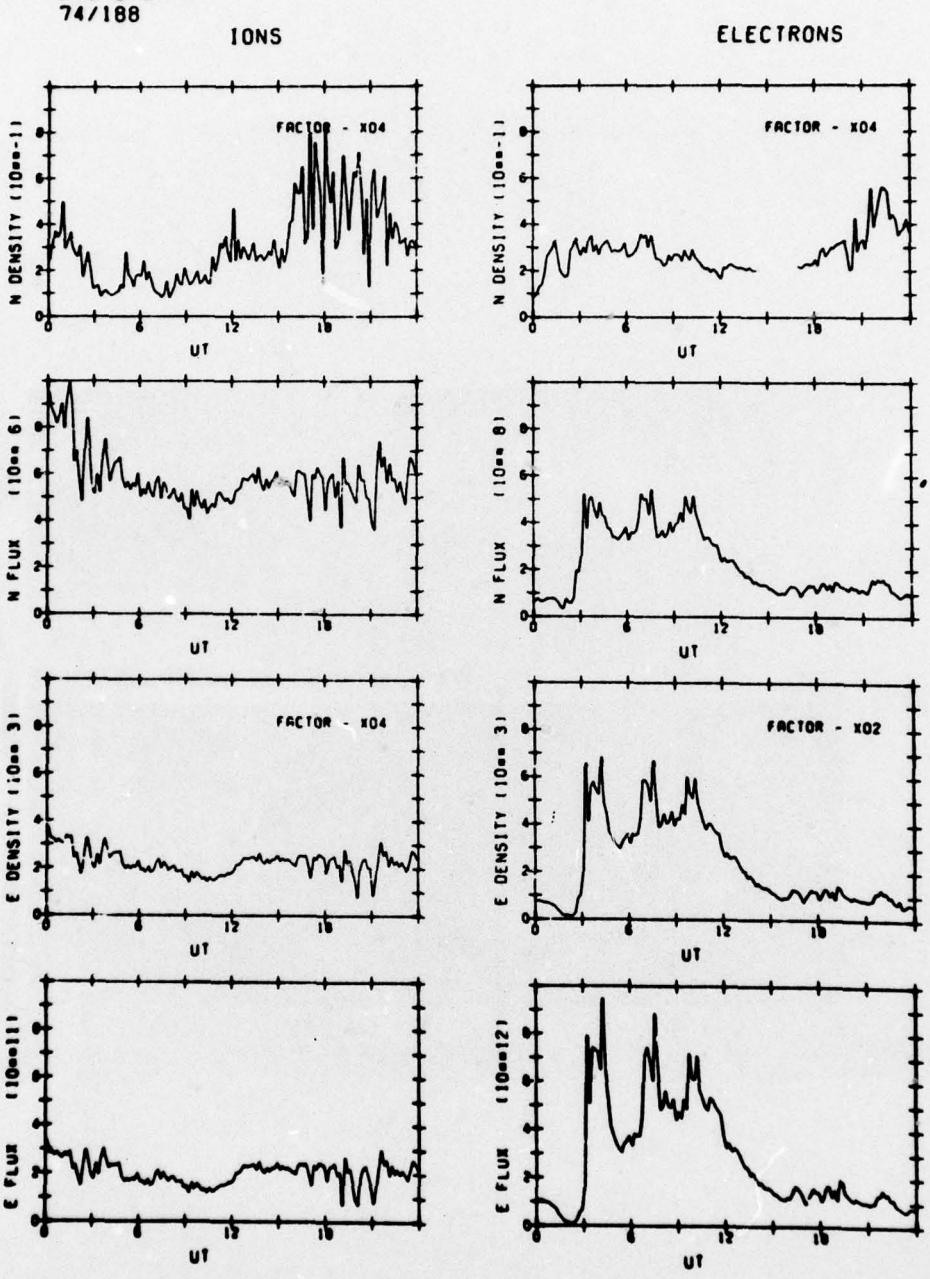
IONS

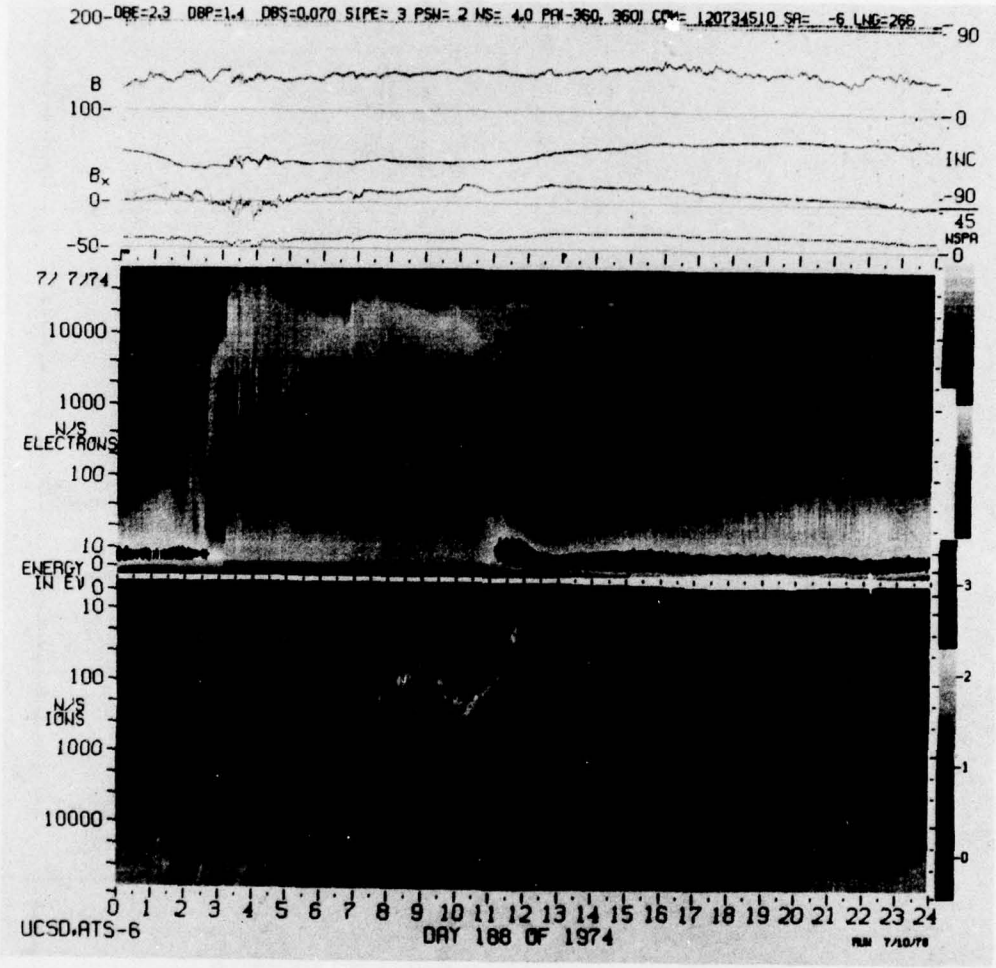
ELECTRONS



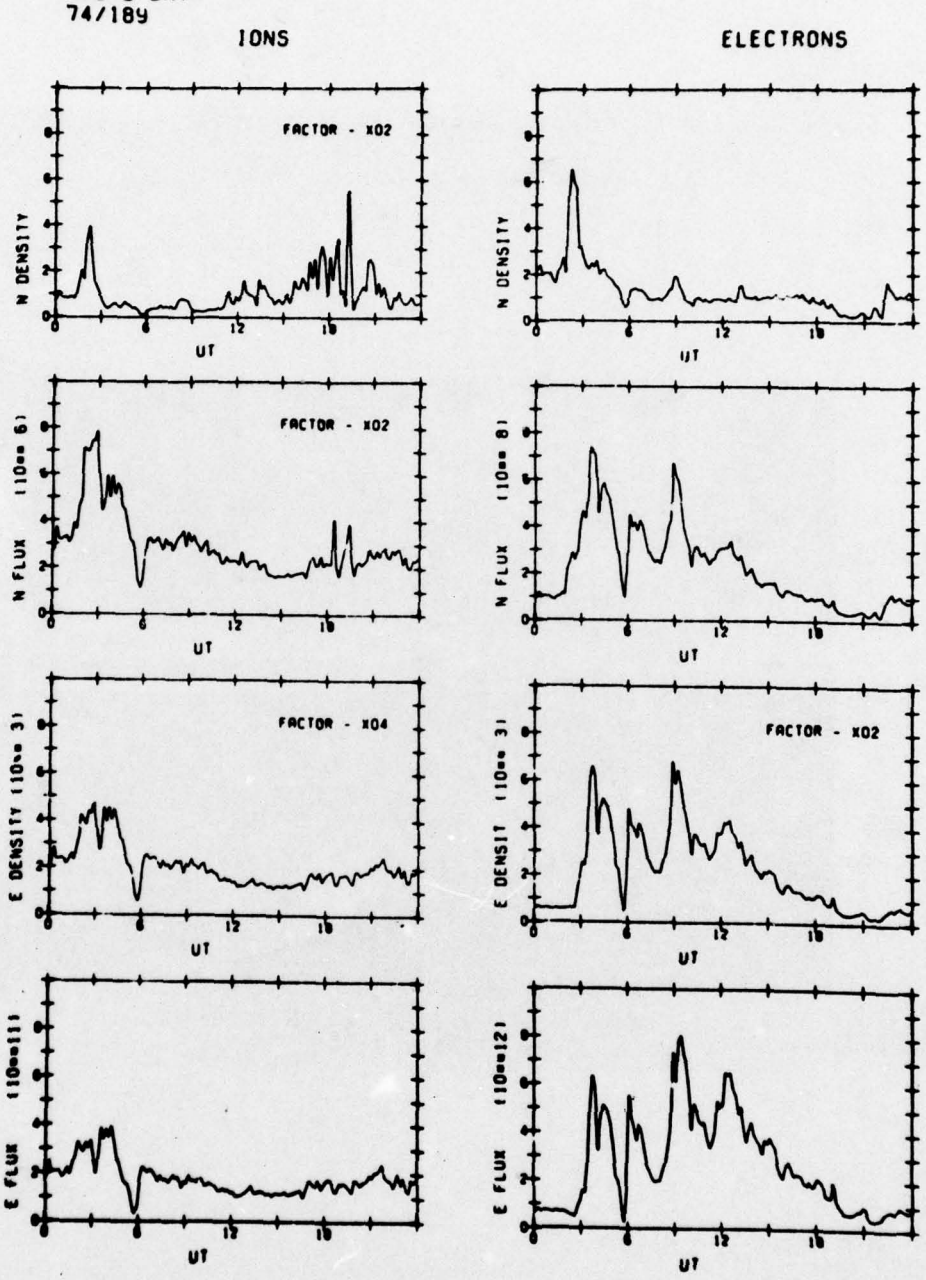

200-
DBE=2.3 DBP=1.4 DBS=0.070 SIPE= 3 PSW= 2 NS= 4.0 PAL=360. 360. COM=1120474530 SA= -6 LNG=266
90
B
100-
-0
INC
Bx
0-
-90
45
-50-
NSPA
-0
7/ 6/74
10000
1000
N/S
ELECTRONS
100
10
ENERGY
IN EV
0
0
10
100
N/S
IONS
1000
10000
-3
-2
-1
-0
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24
UCSD.ATS-6
DAY 187 OF 1974
RUN 7/10/75

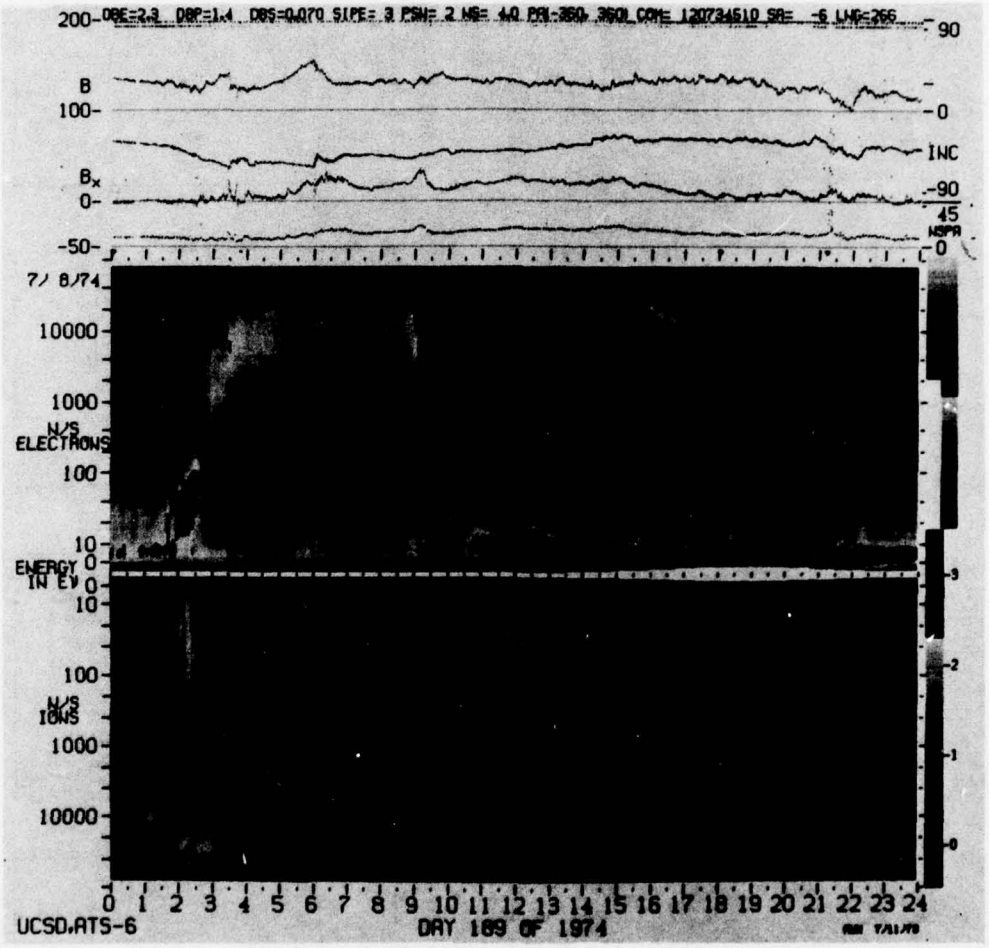
ATS-6 DATA
74/188

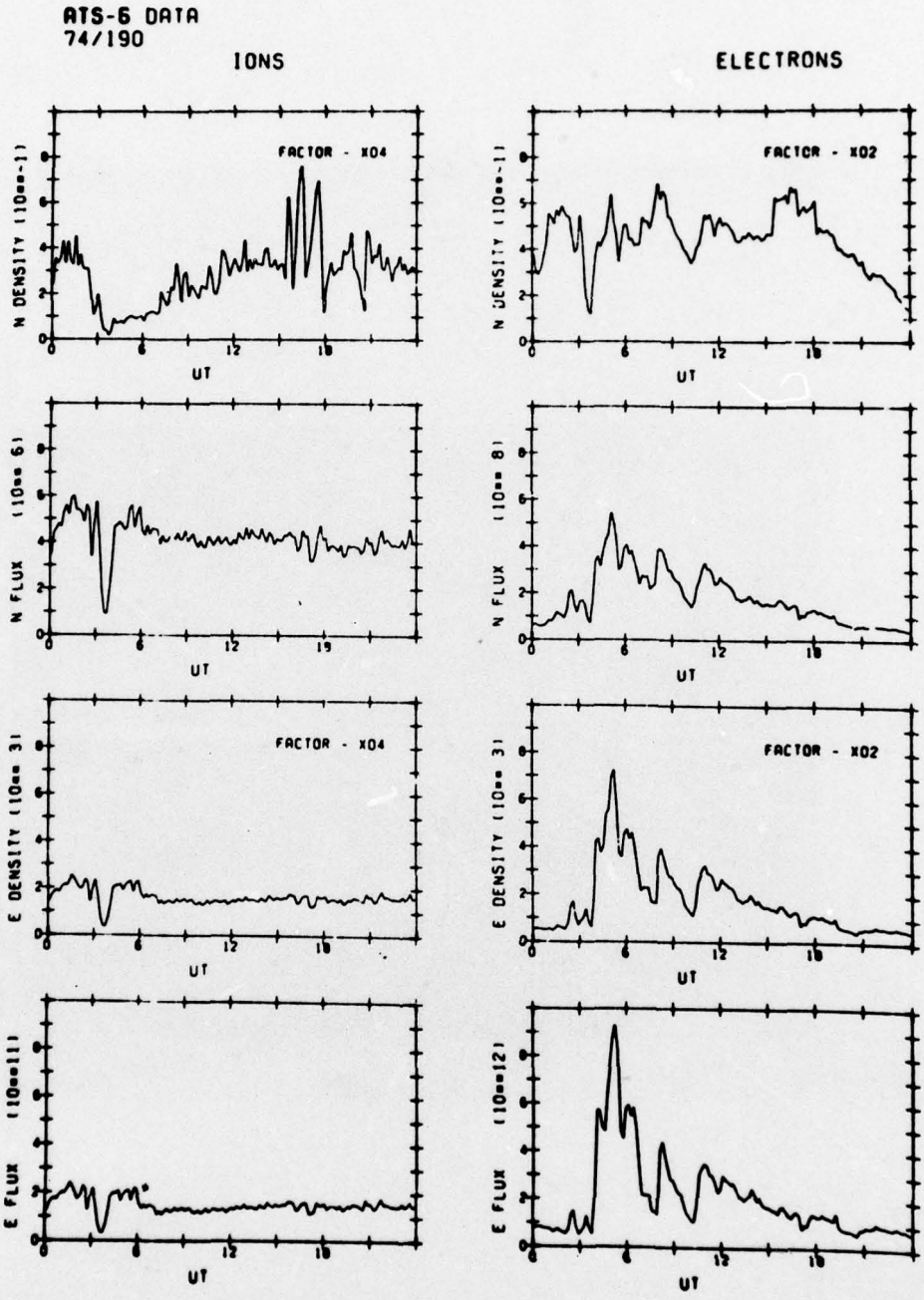


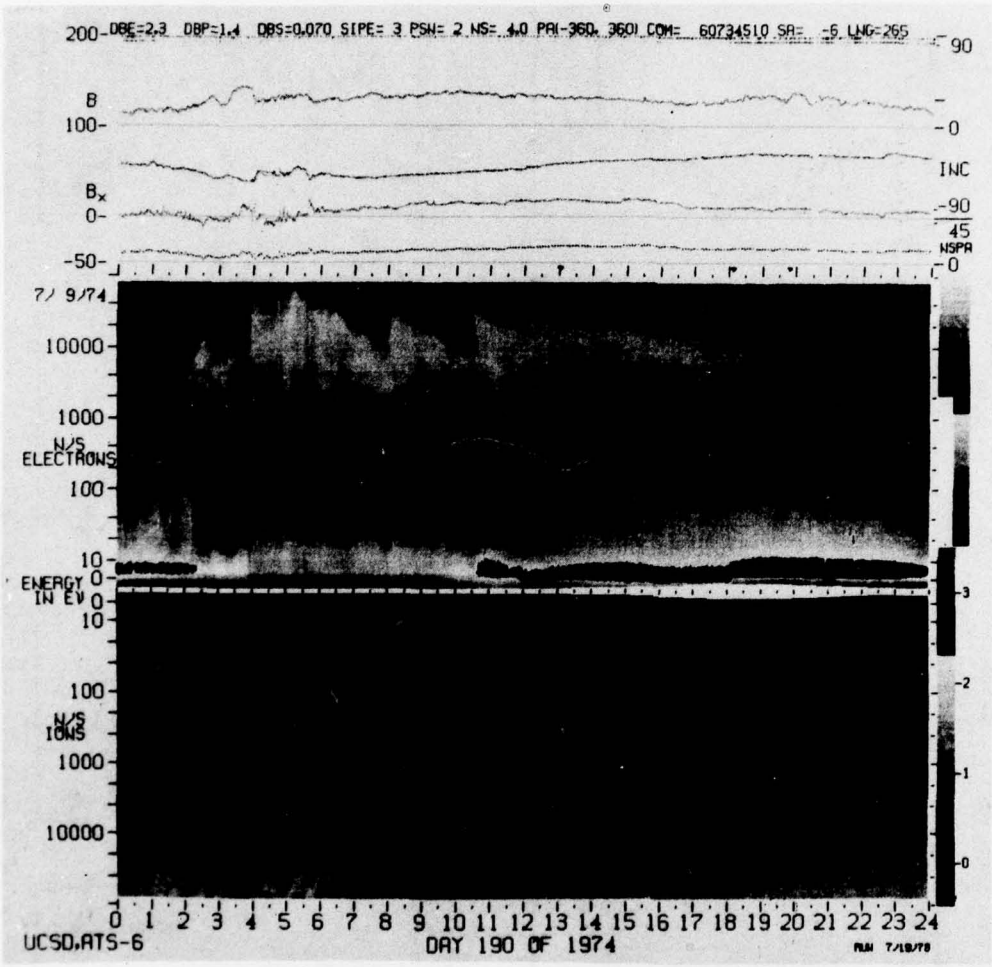

200-DBE=2.3 DBP=1.4 DBS=0.070 SIPE= 3 PSW= 2 NS= 4.0 PAI-360, 360] COM= 120734510 SA= -6 LNG=266
90
B
100-
0
INC
B_x
0-
-90
45
-50-
NSPA
0
7/ 7/74
10000
1000
N/S
ELECTRONS
100
10
ENERGY
IN EV
0
0
10
100
N/S
IONS
1000
10000
3
2
1
0
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24
UCSD,ATS-6
DAY 188 OF 1974
RUN 7/10/78

ATS-6 DATA
74/189

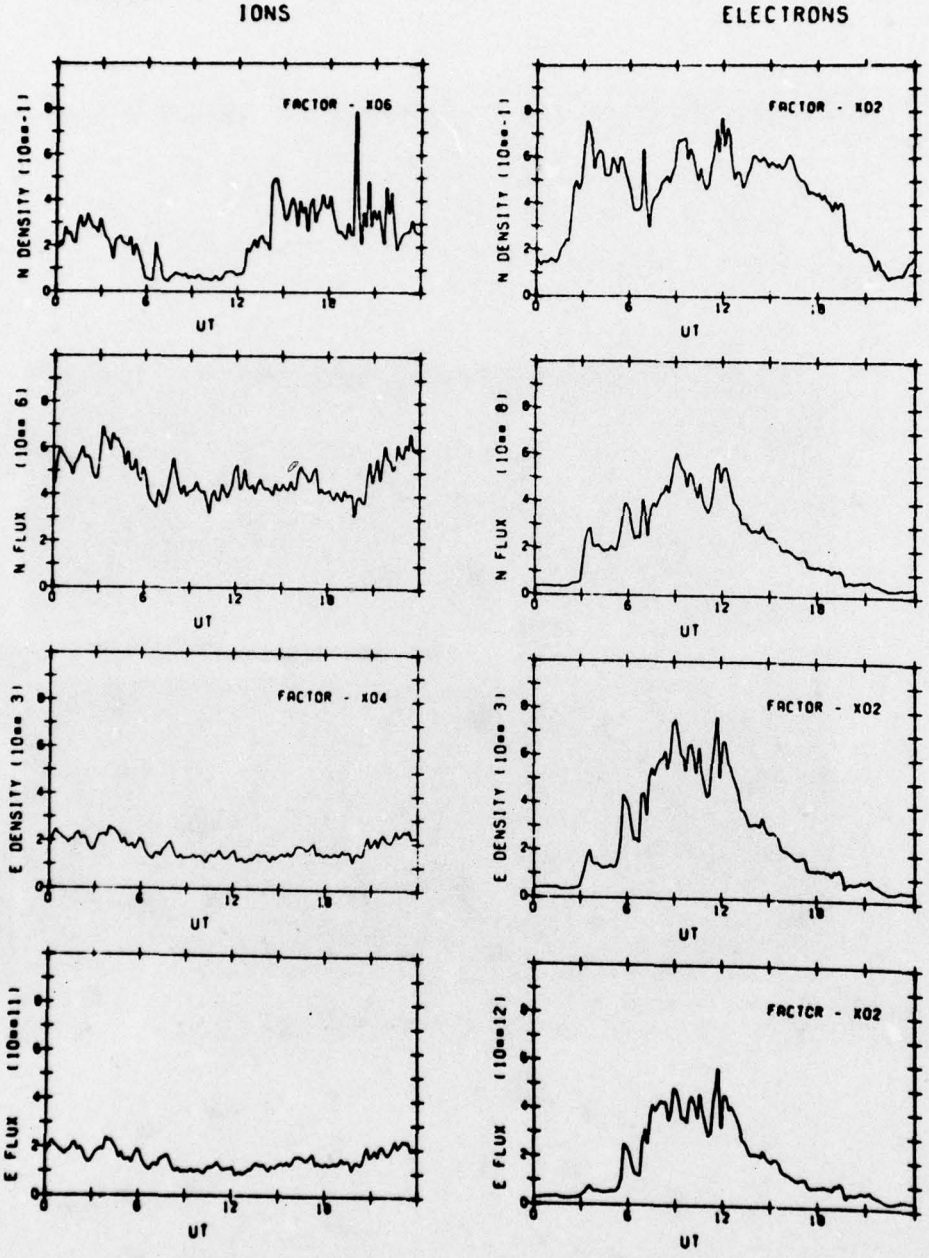


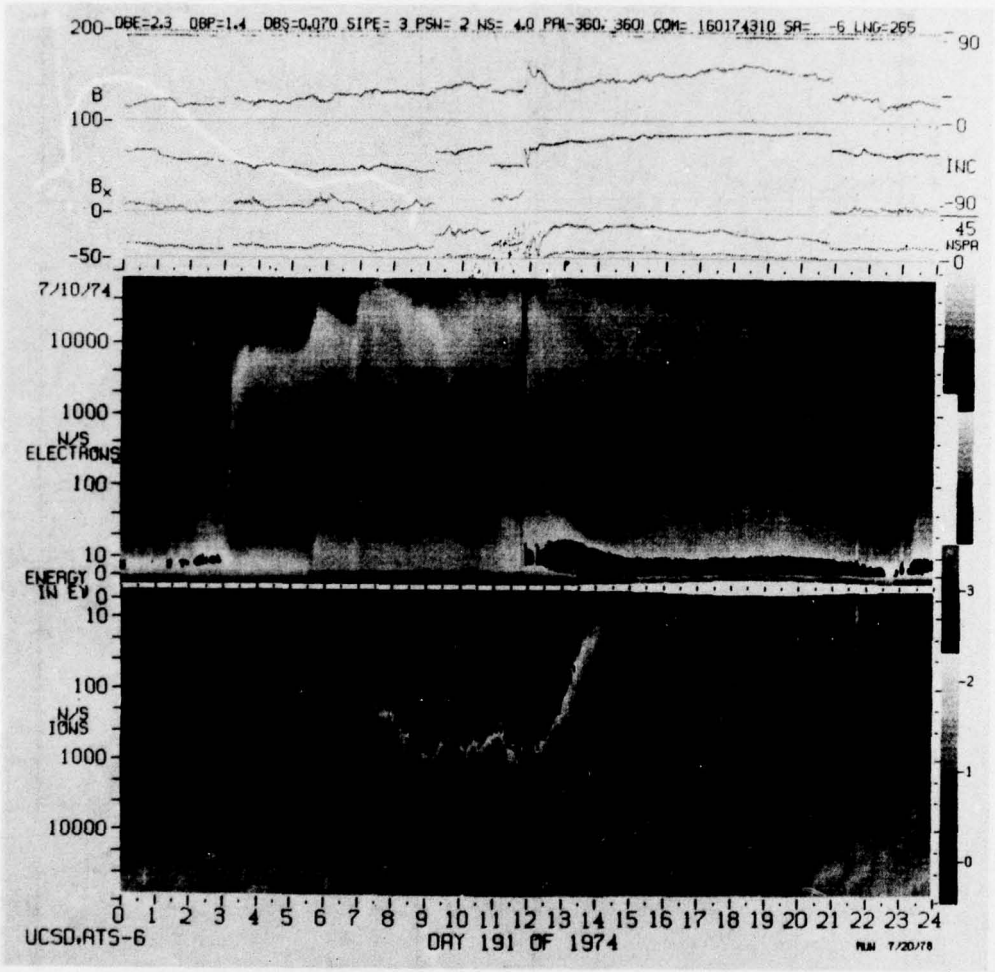

200-
B
100-
Bx
0-
-50-
INC
-90
45
KSPR
7/ 8/74
10000
1000
N/S
ELECTRONS
100
10
ENERGY
IN EV
0
10
100
N/S
IONS
1000
10000
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24
UCSD,ATS-6
DAY 189 OF 1974


ATS-6 DATA
74/190
IONS
ELECTRONS
FACTOR - X04
FACTOR - X02
N DENSITY (10**-1)
N FLUX (10** 6)
N FLUX (10** 8)
E DENSITY (10** 3)
E FLUX (10**11)
E FLUX (10**12)
UT

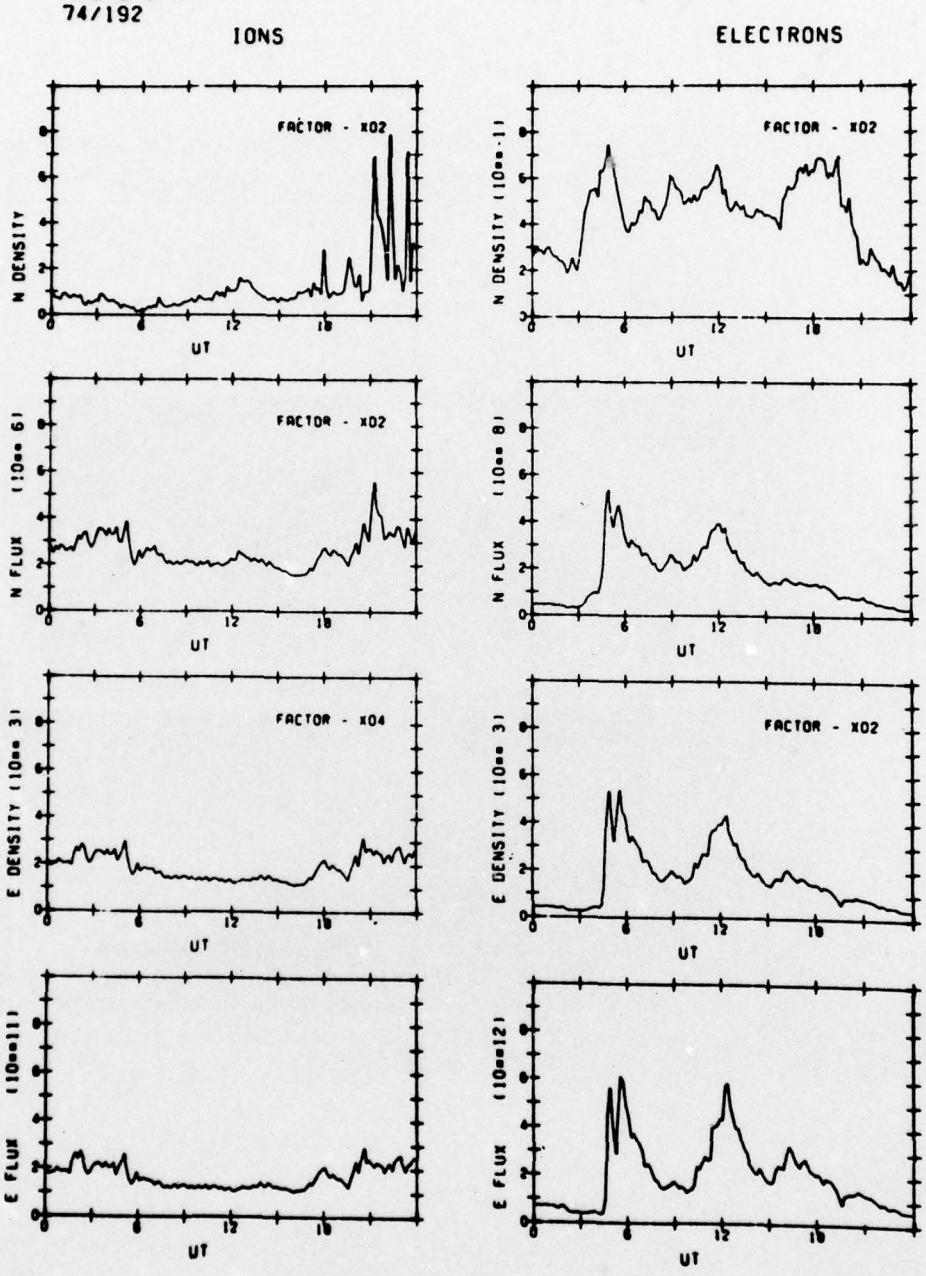

DBE=2.3 DBP=1.4 DBS=0.070 SIPE= 3 PSN= 2 NS= 4.0 PA(-360, 360) COM= 60734510 SA= -6 LNG=265
200
B
100
Bx
0
-50
90
0
INC
-90
45
NSPA
0
7/ 9/74
10000
1000
N/S ELECTRONS
100
10
ENERGY IN EV
0
0
10
100
N/S IONS
1000
10000
3
2
1
0
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24
UCSD,ATS-6
DAY 190 OF 1974
RUN 7/19/78

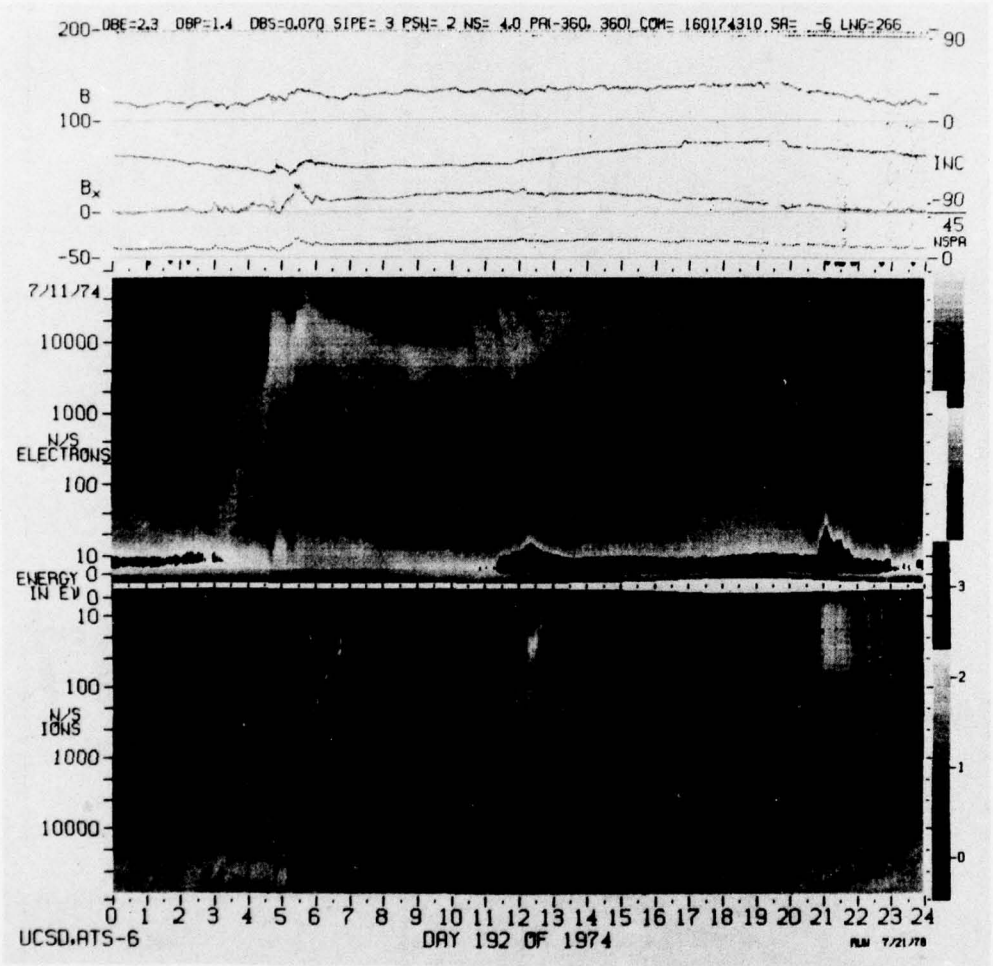
ATS-6 DATA
74/191



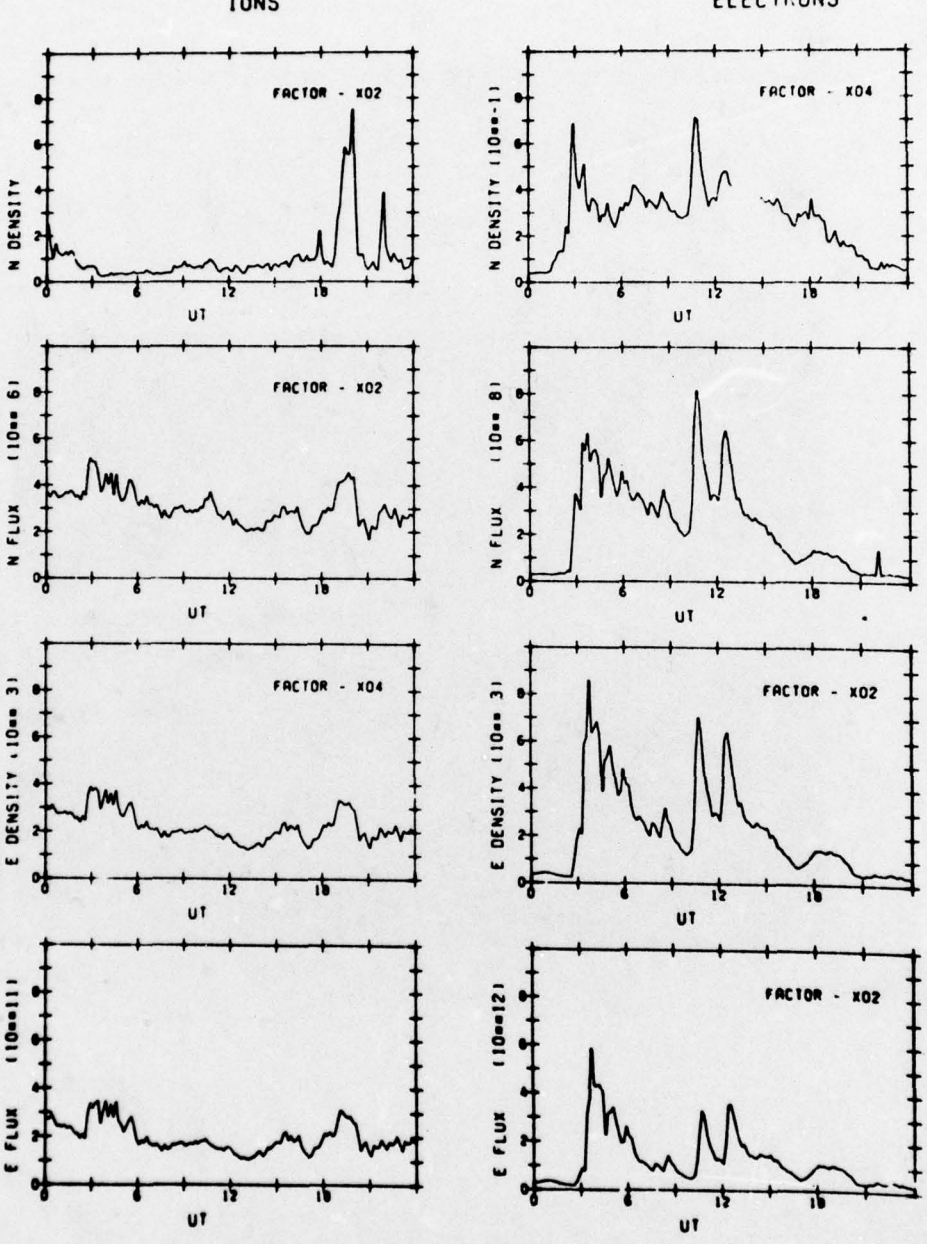

DBE=2.3 DBP=1.4 DBS=0.070 SIPE= 3 PSW= 2 NS= 4.0 PAL=360. 360 COM= 160174310 SA= -6 LNG=265
B
Bx
INC
NSPA
7/10/74
N/S ELECTRONS
ENERGY IN EV
N/S IONS
UCSD,ATS-6
DAY 191 OF 1974
RUN 7/20/78

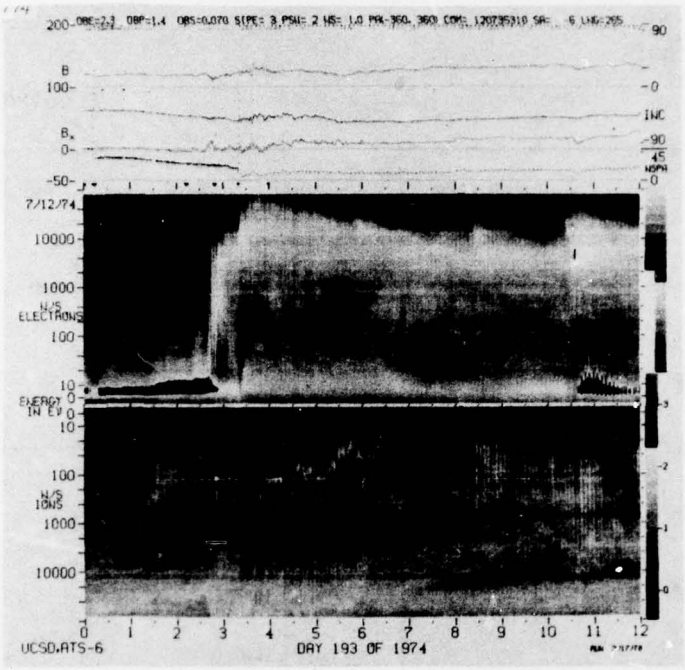
ATS-6 DAT
74/192

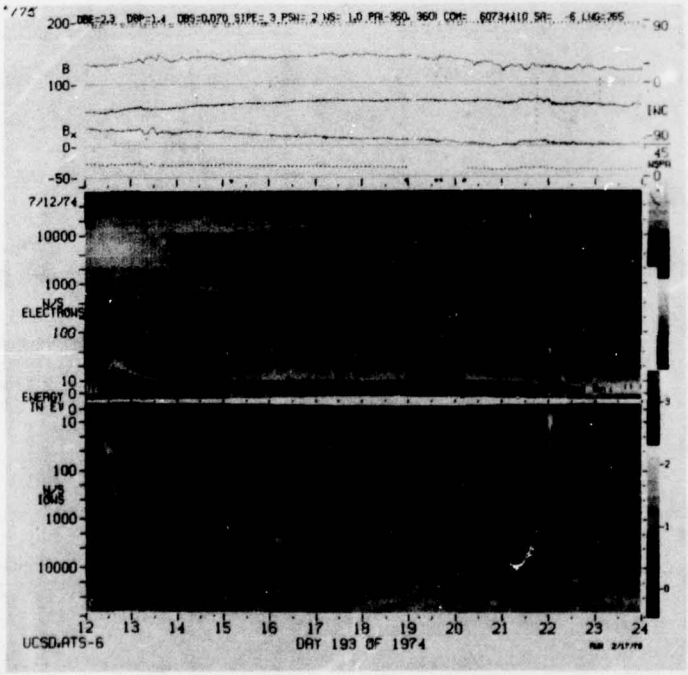


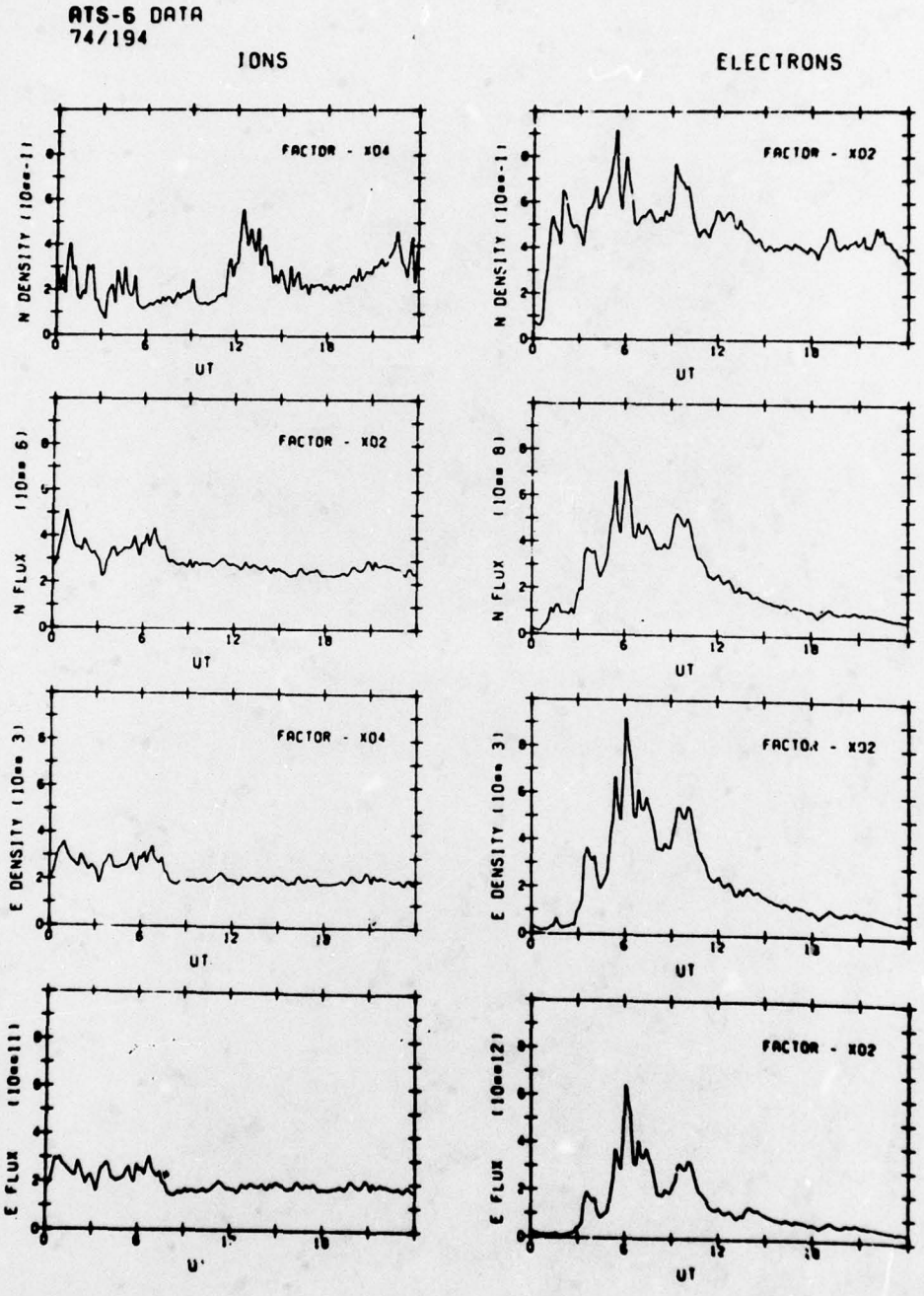

200-DBE=2.3 DBP=1.4 DBS=0.070 SIPE= 3 PSN= 2 NS= 4.0 PRI=360, 360] COM= 160174310 SA= -6 LNG=266
90
B
100-
-0
INC
Bx
0-
-90
45
NSPA
-50-
0
7/11/74
10000
1000
N/S
ELECTRONS
100
10
ENERGY
IN EV
0
0
10
100
N/S
IONS
1000
10000
-3
-2
-1
-0
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24
UCSD,ATS-6
DAY 192 OF 1974
RLM 7/21/78

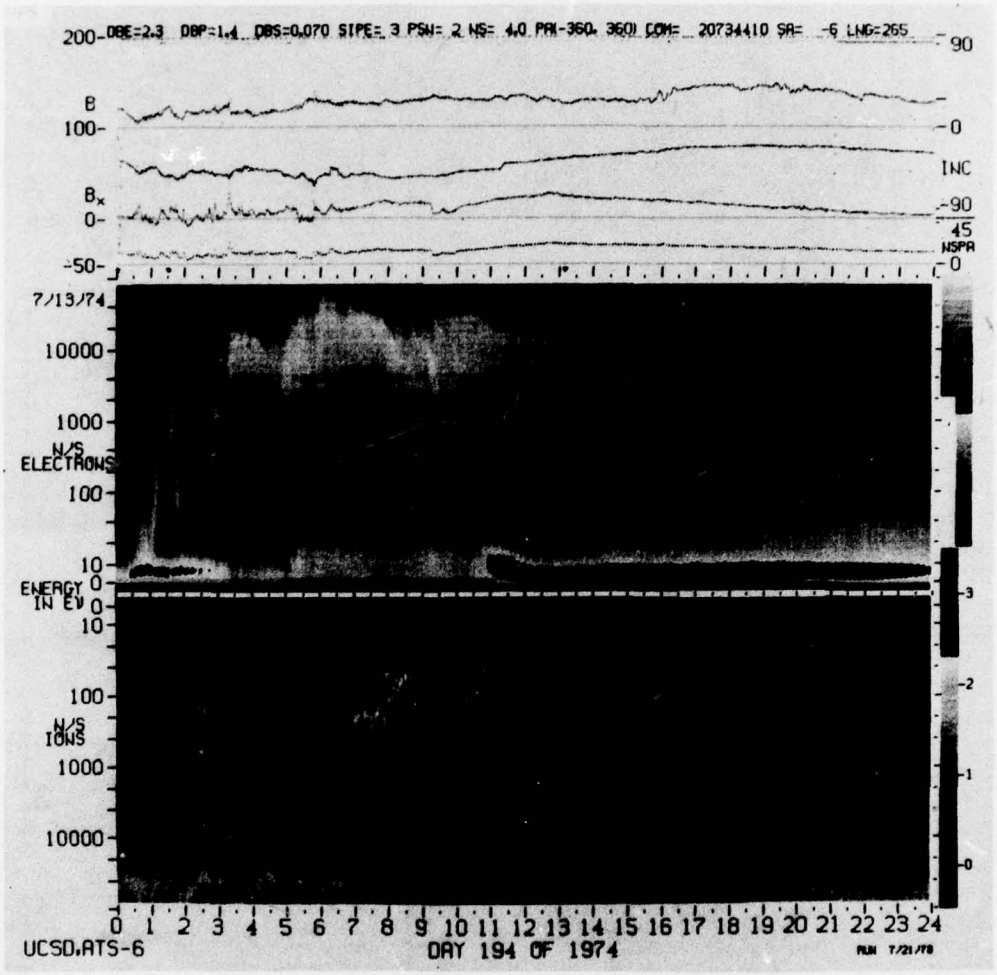
ATS-6 DATA
74/193

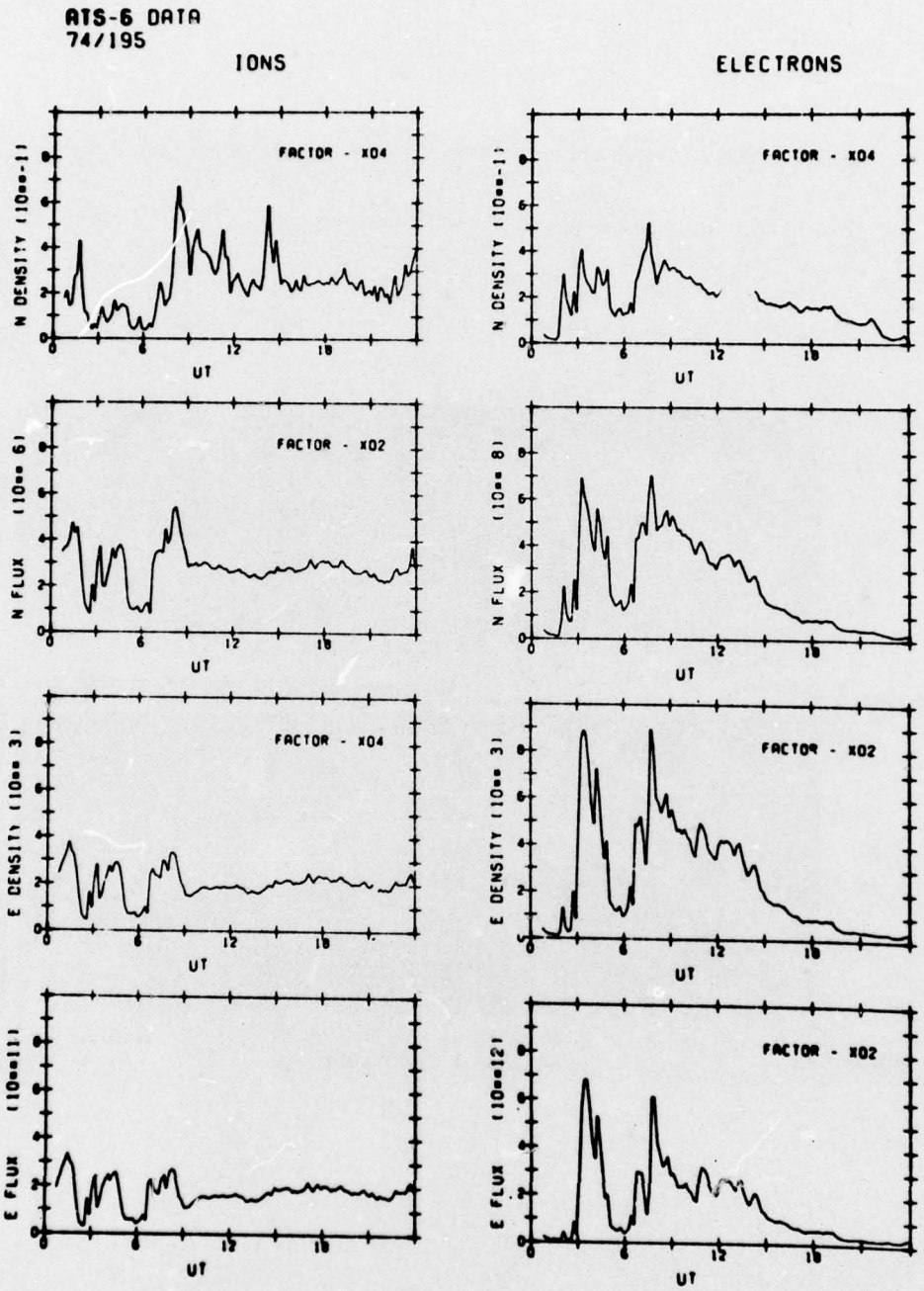


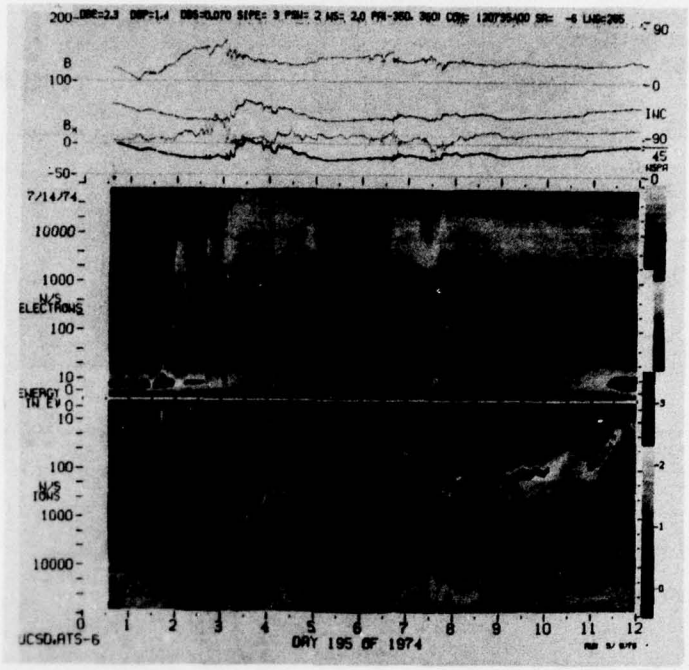

B
Bx
INC
7/12/74
ELECTRONS
IONS
ENERGY IN EV
UCSD,ATS-6
DAY 193 OF 1974


B
Bx
INC
7/12/74
ELECTRONS
IONS
ENERGY IN EV
UCSD,ATS-6
DAY 193 OF 1974


ATS-6 DATA
74/194
IONS
ELECTRONS
FACTOR - X04
FACTOR - X02
N DENSITY (10**-1)
N FLUX (10** 6)
E DENSITY (10** 3)
E FLUX (10**11)
E FLUX (10**12)
UT


200-DBE=2.3 DBP=1.4 DBS=0.070 SIPE=.3 PSW= 2 NS= 4.0 PRI-360. 360) COM= 20734410 SA= -6 LNG=265
90
B
100-
0
INC
Bx
0-
-90
45
NSPR
-50-
0
7/13/74
10000
1000
N/S
ELECTRONS
100
10
ENERGY 0
IN EV 0
10
100
N/S
IONS
1000
10000
3
2
1
0
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24
UCSD.ATS-6
DAY 194 OF 1974
RUN 7/21/78


ATS-6 DATA
74/195
IONS
ELECTRONS
N DENSITY (10**-1)
FACTOR - X04
UT
N FLUX (10** 6)
FACTOR - X02
N FLUX (10** 8)
E DENSITY (10** 3)
FACTOR - X04
FACTOR - X02
E FLUX (10**11)
E FLUX (10**12)
0
6
12
18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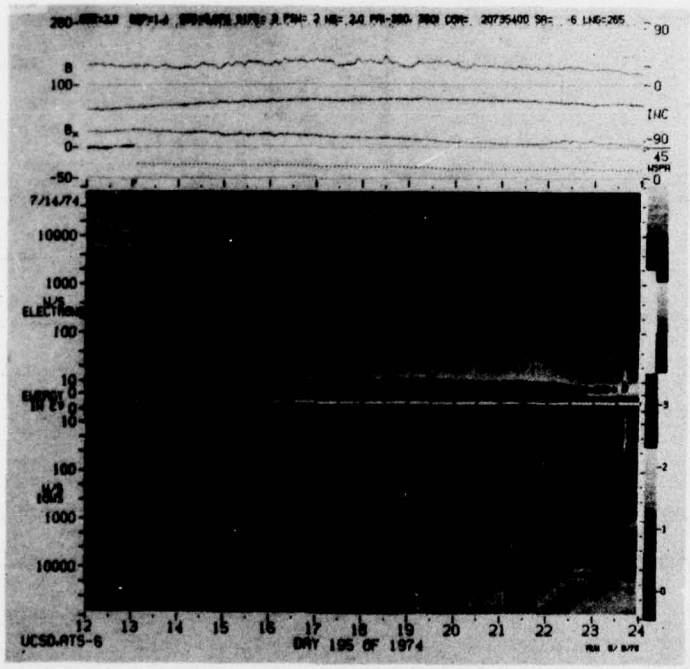
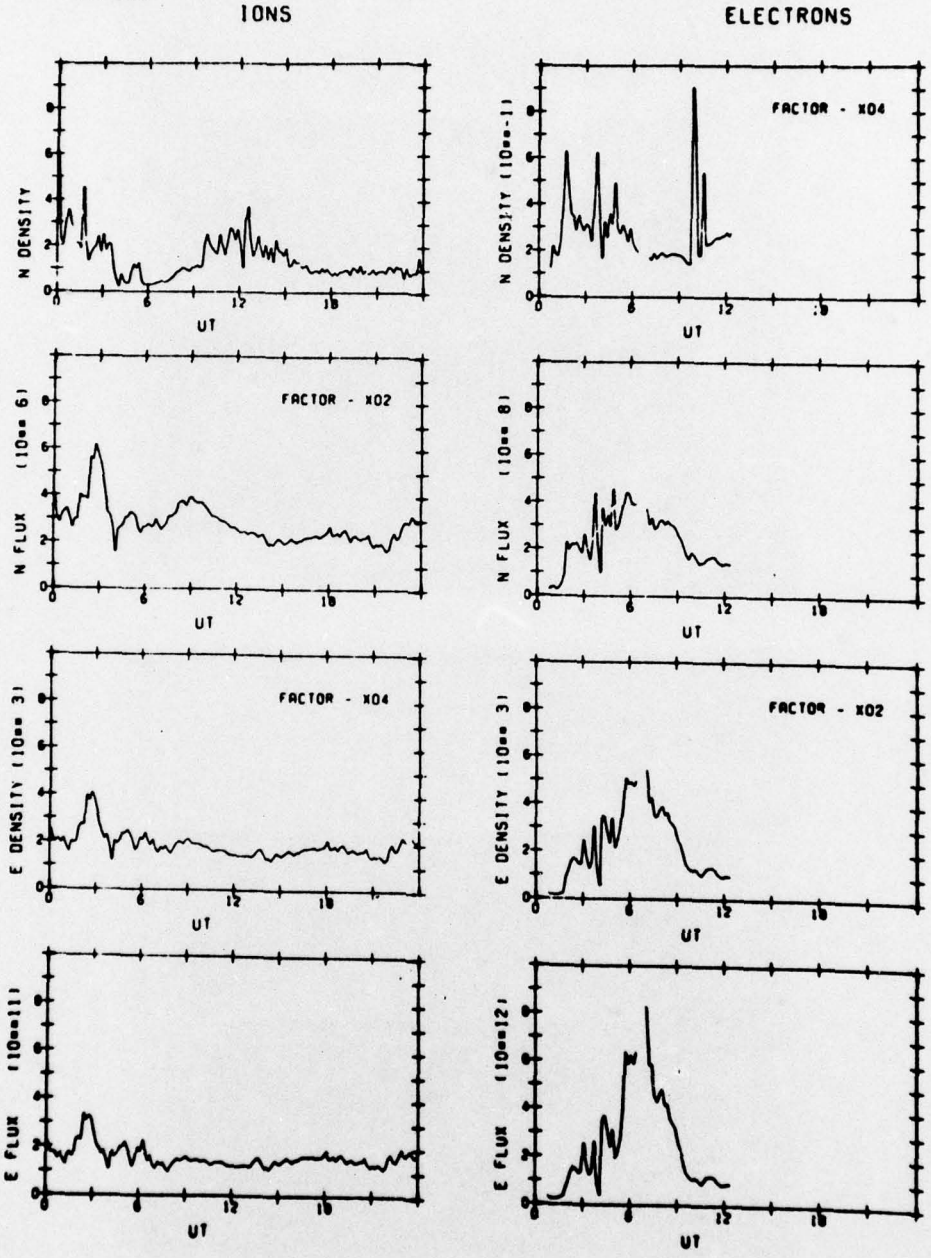
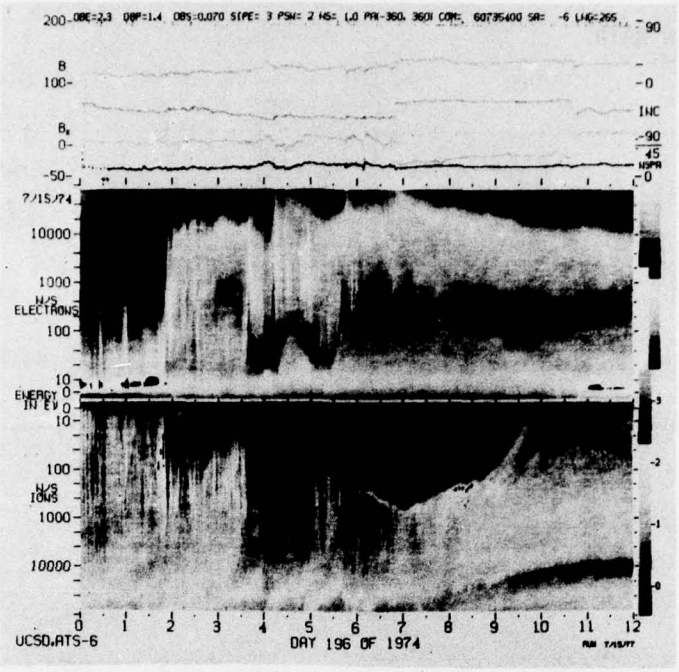
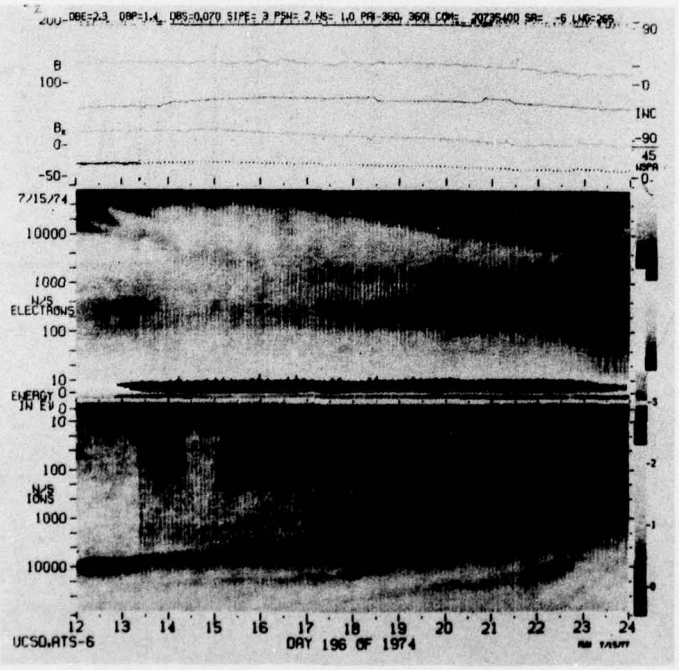
UCSD,ATS-6
DAY 195 OF 1974

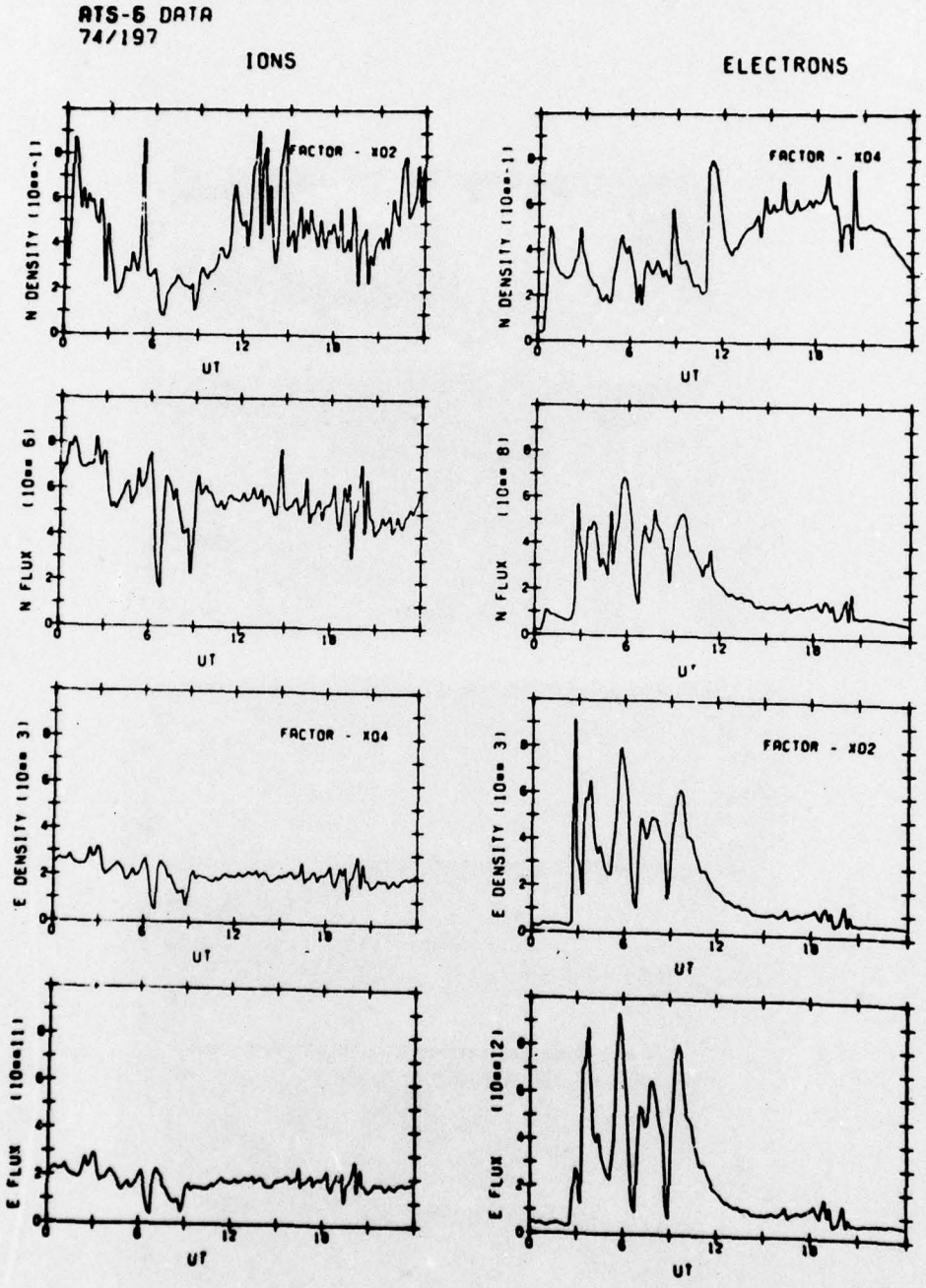

7/14/74
UCSD,ATS-6
DAY 195 OF 1974

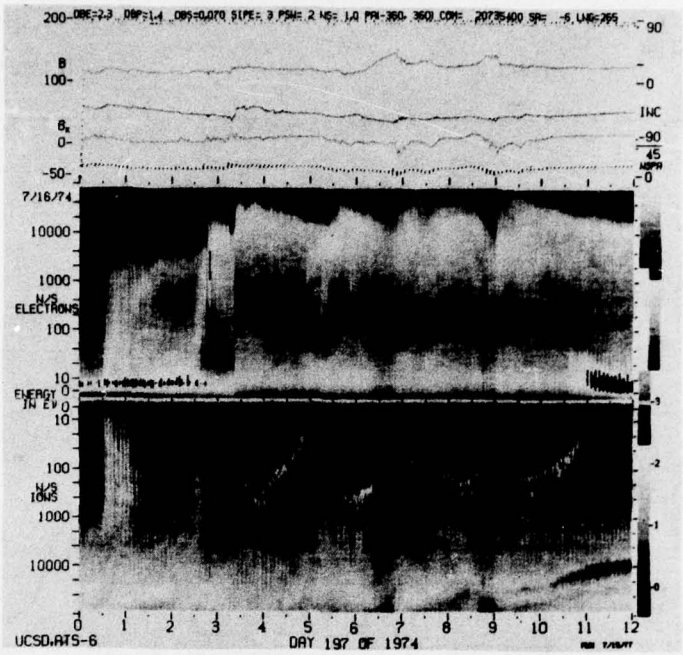
ATS-6 DATA
74/196

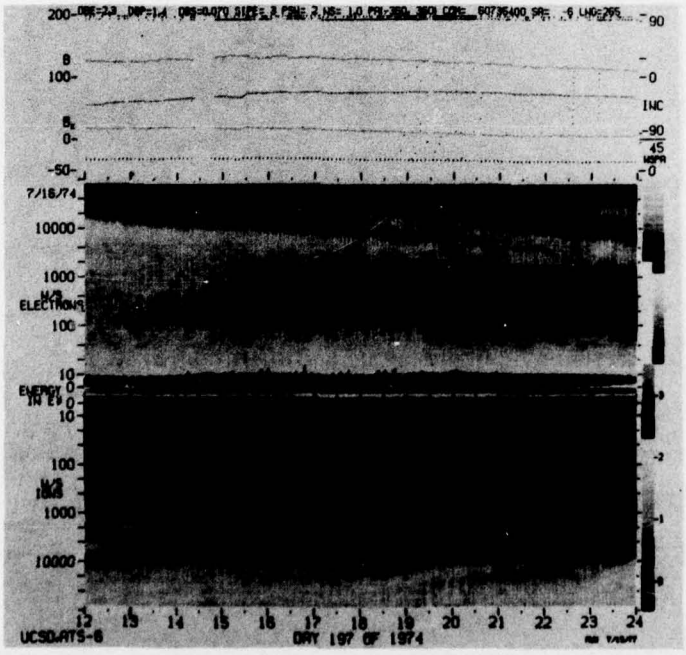



B
100-
B_x
0-
-50-
INC
-90
45
0
7/15/74
10000
1000
H/S
ELECTRONS
100
10
ENERGY
IN EV
0
10
100
H/S
IONS
1000
10000
0 1 2 3 4 5 6 7 8 9 10 11 12
UCSD,ATS-6
DAY 196 OF 1974

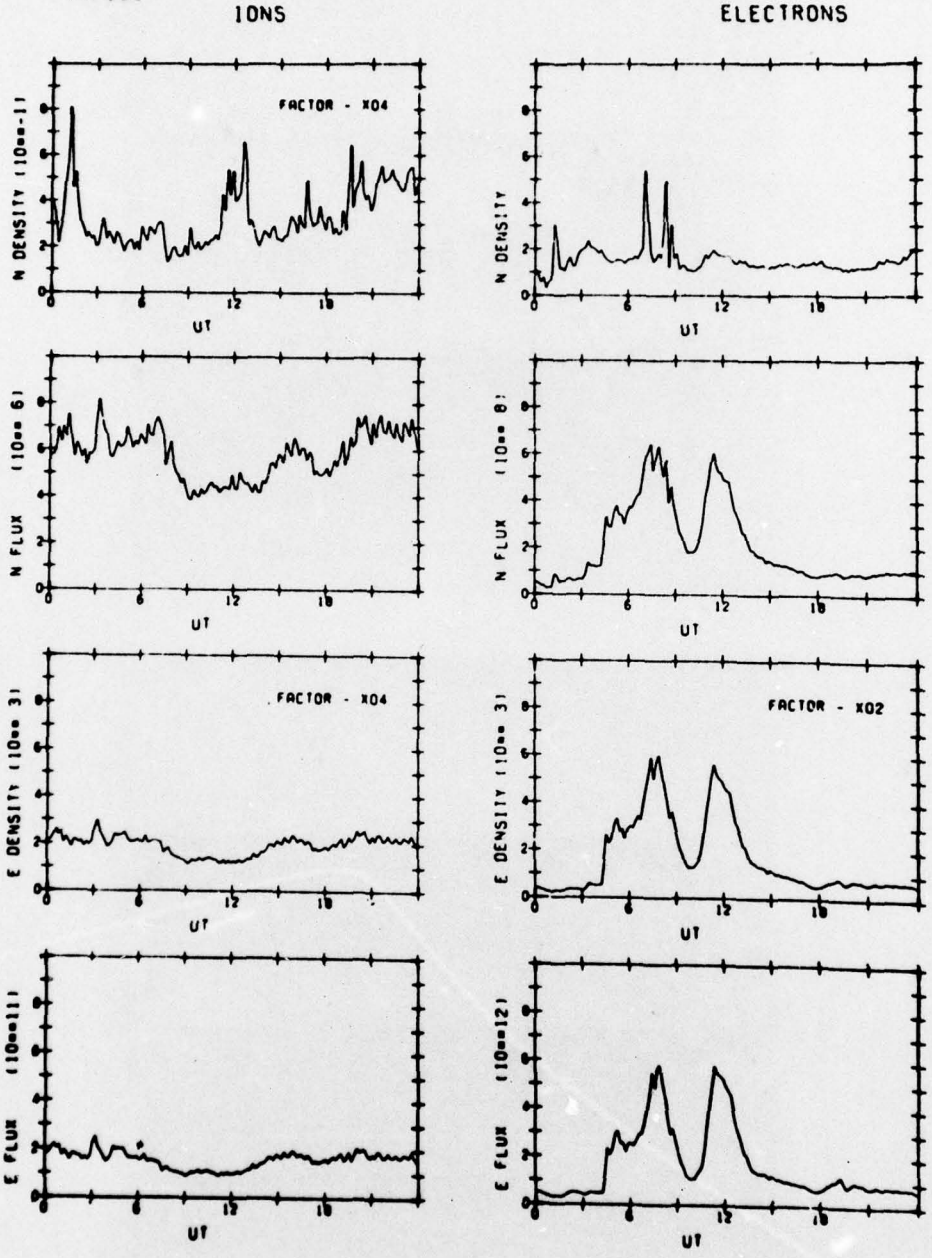

B
100-
B_x
0-
-50-
INC
-90
45
0
7/15/74
10000
1000
H/S
ELECTRONS
100
10
ENERGY
IN EV
0
10
100
H/S
IONS
1000
10000
12 13 14 15 16 17 18 19 20 21 22 23 24
UCSD,ATS-6
DAY 196 OF 1974

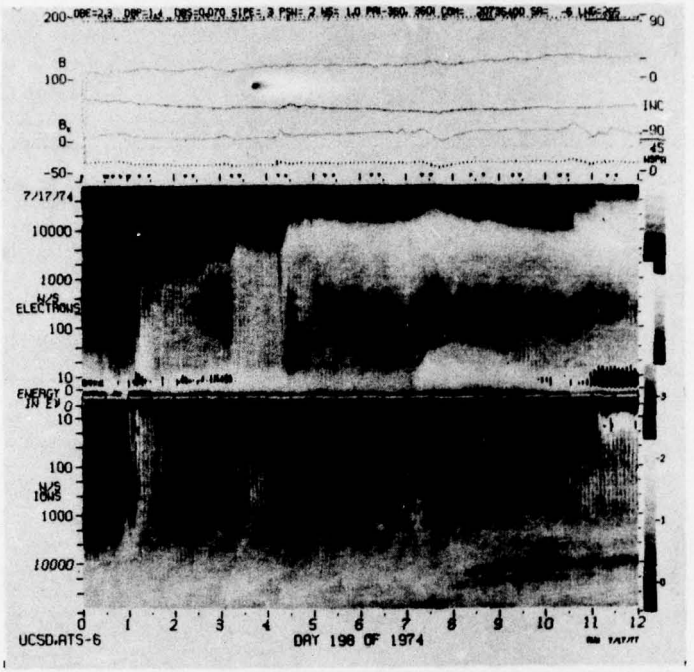

ATS-6 DATA
74/197
IONS
ELECTRONS
FACTOR - X02
FACTOR - X04
N DENSITY (10**-1)
N FLUX (10** 6)
E DENSITY (10** 3)
E FLUX (10**11)
E FLUX (10**12)
UT

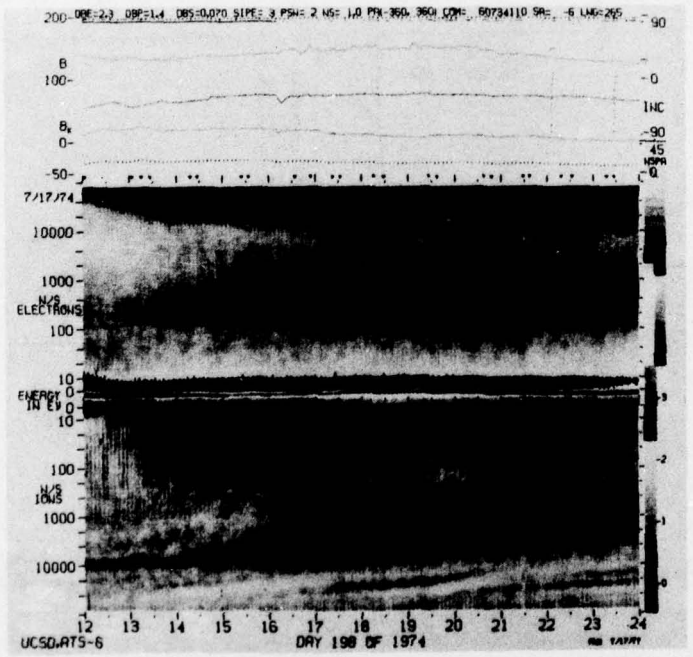

B
100-
B_x
0-
-50-
INC
-90
45
MSPR
7/16/74
10000
1000
M/S
ELECTRONS
100
10
ENERGY
IN EV
10
100
M/S
IONS
1000
10000
0 1 2 3 4 5 6 7 8 9 10 11 12
UCSD,ATS-6
DAY 197 OF 1974


B
100-
B_x
0-
-50-
INC
-90
45
MSPR
7/16/74
10000
1000
M/S
ELECTRONS
100
10
ENERGY
IN EV
10
100
M/S
IONS
1000
10000
13 14 15 16 17 18 19 20 21 22 23 24
UCSD,ATS-6
DAY 197 OF 1974

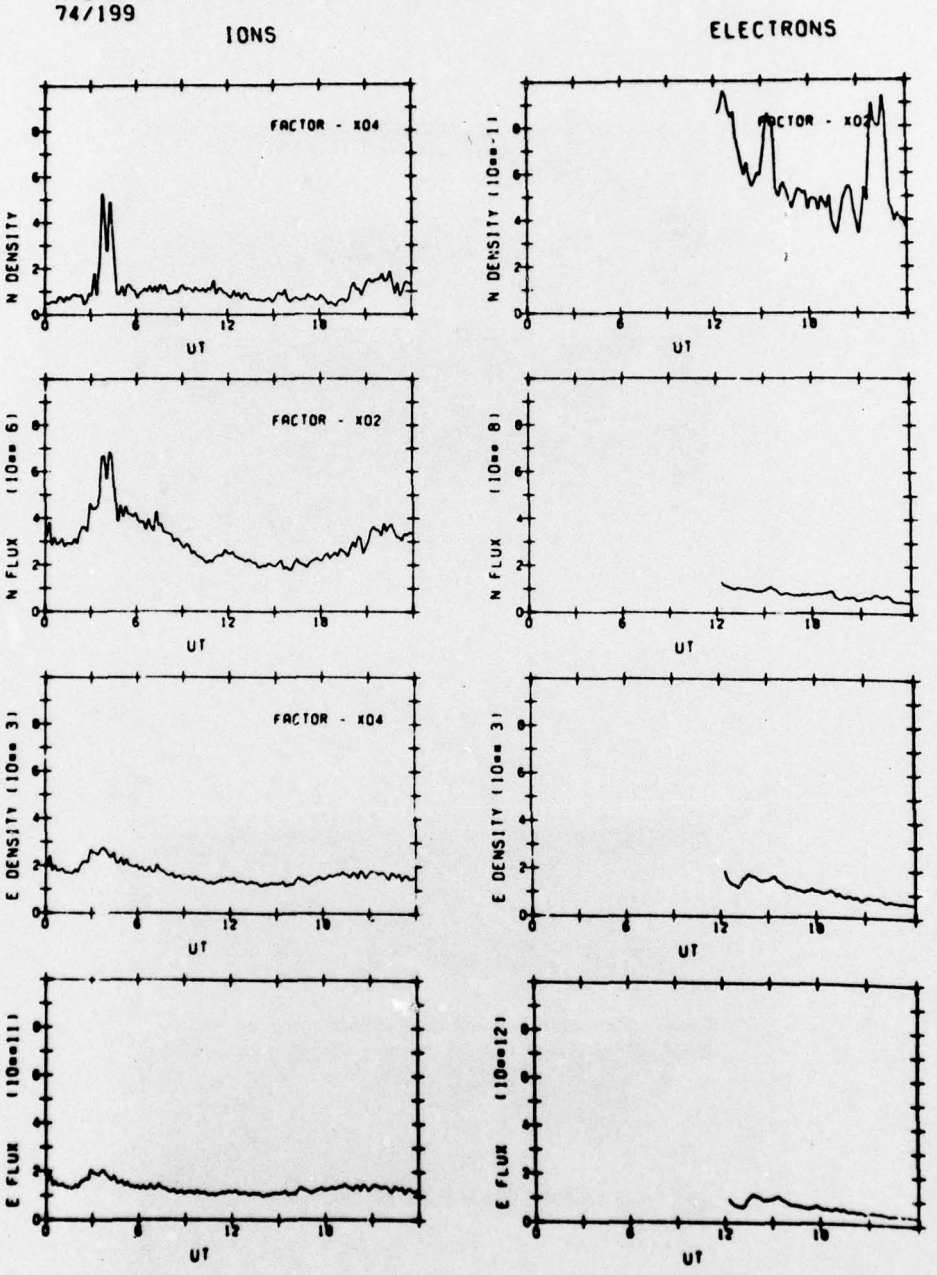
ATS-6 DATA
74/198

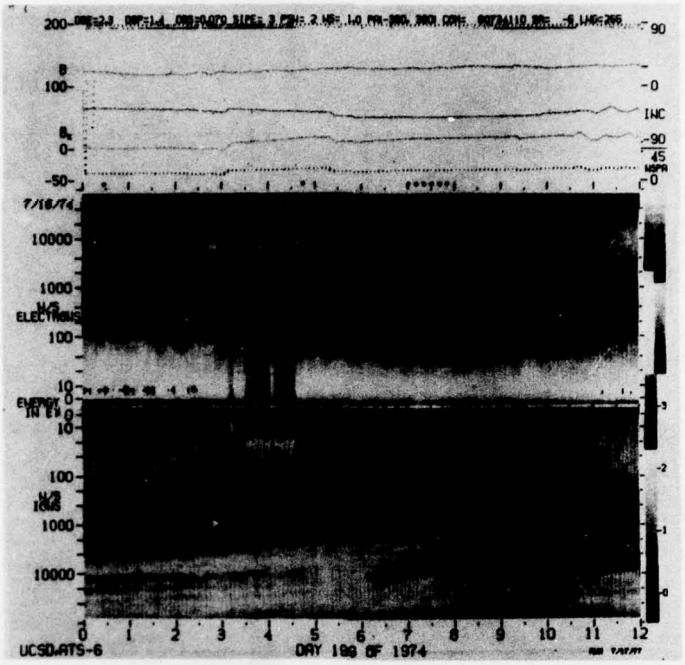


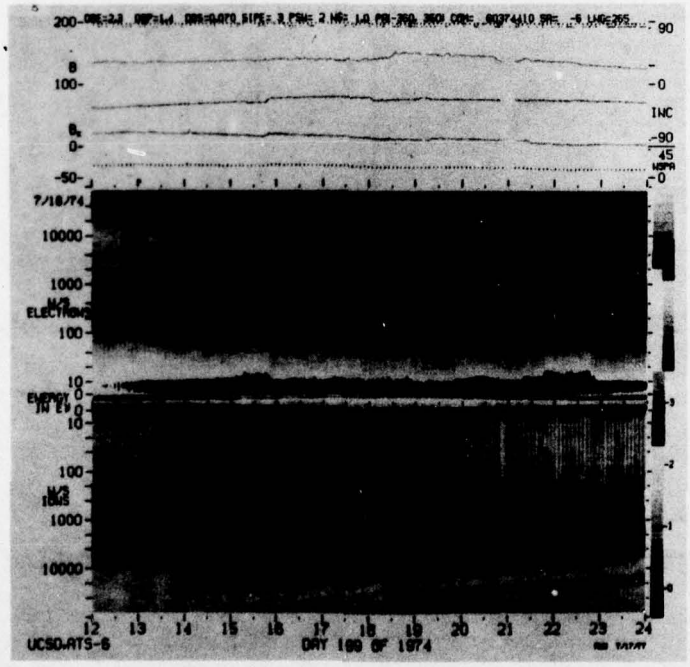

B
100-
B_x
0-
-50-
INC
90
0
-90
45
MSPH
7/17/74
10000
1000
N/S
ELECTRONS
100
10
ENERGY
IN EV
10
100
N/S
IONS
1000
10000
0 1 2 3 4 5 6 7 8 9 10 11 12
UCSD-ATS-6
DAY 198 OF 1974

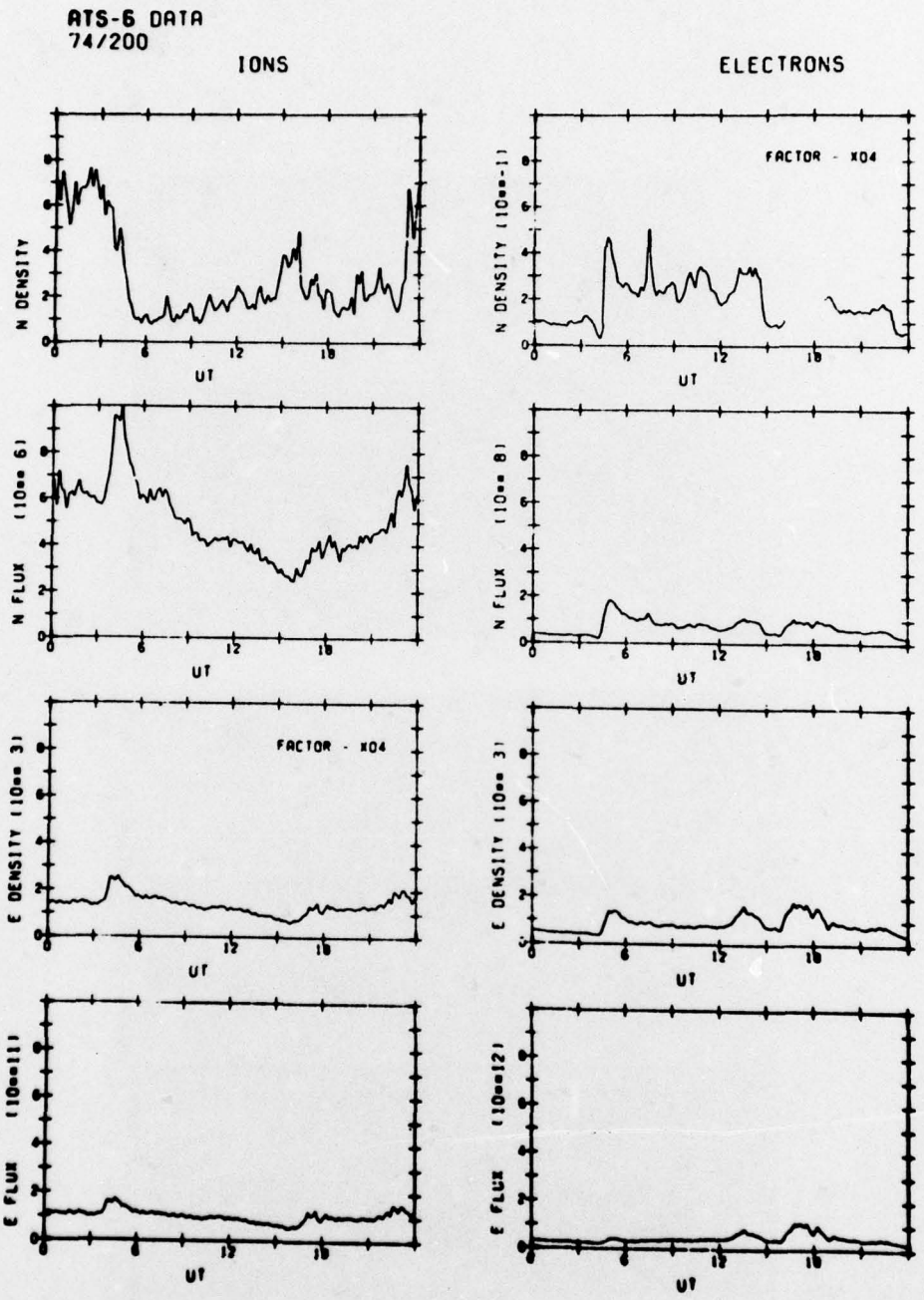

B
100-
B_x
0-
-50-
INC
90
0
-90
45
MSPH
7/17/74
10000
1000
N/S
ELECTRONS
100
10
ENERGY
IN EV
10
100
N/S
IONS
1000
10000
12 13 14 15 16 17 18 19 20 21 22 23 24
UCSD-ATS-6
DAY 198 OF 1974

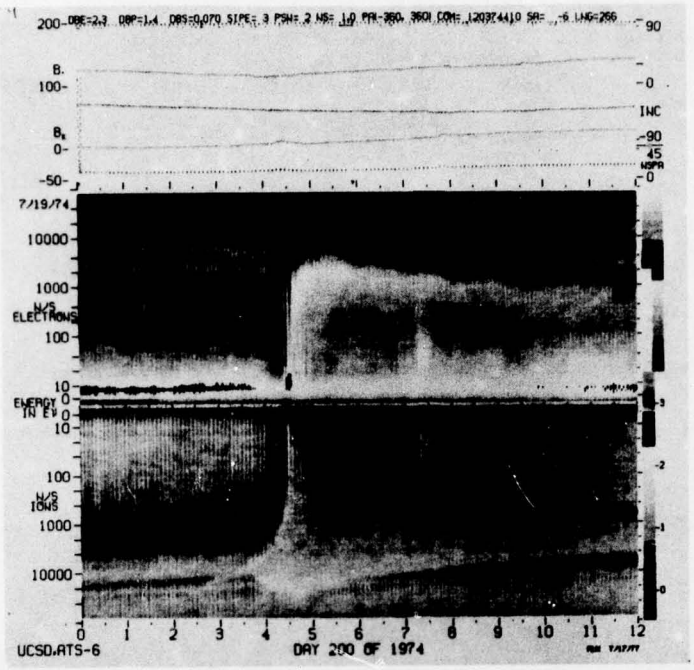
ATS-6 DATA
74/199

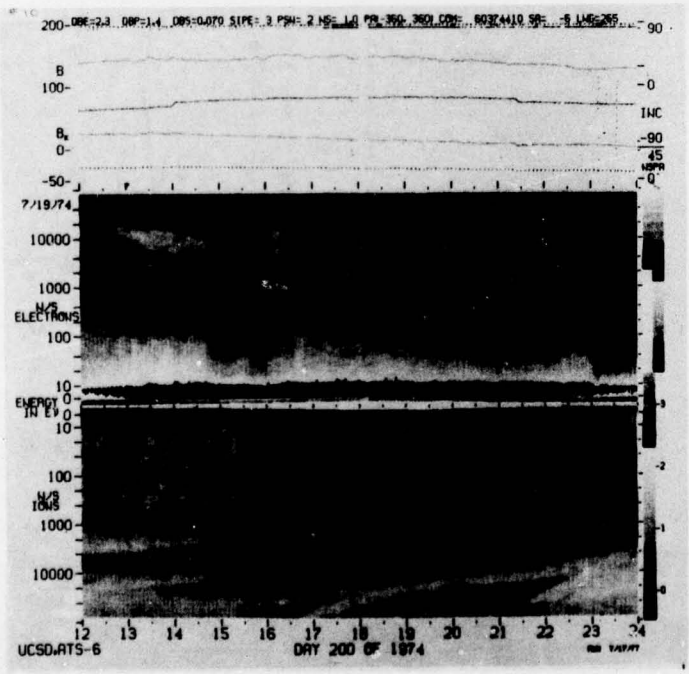


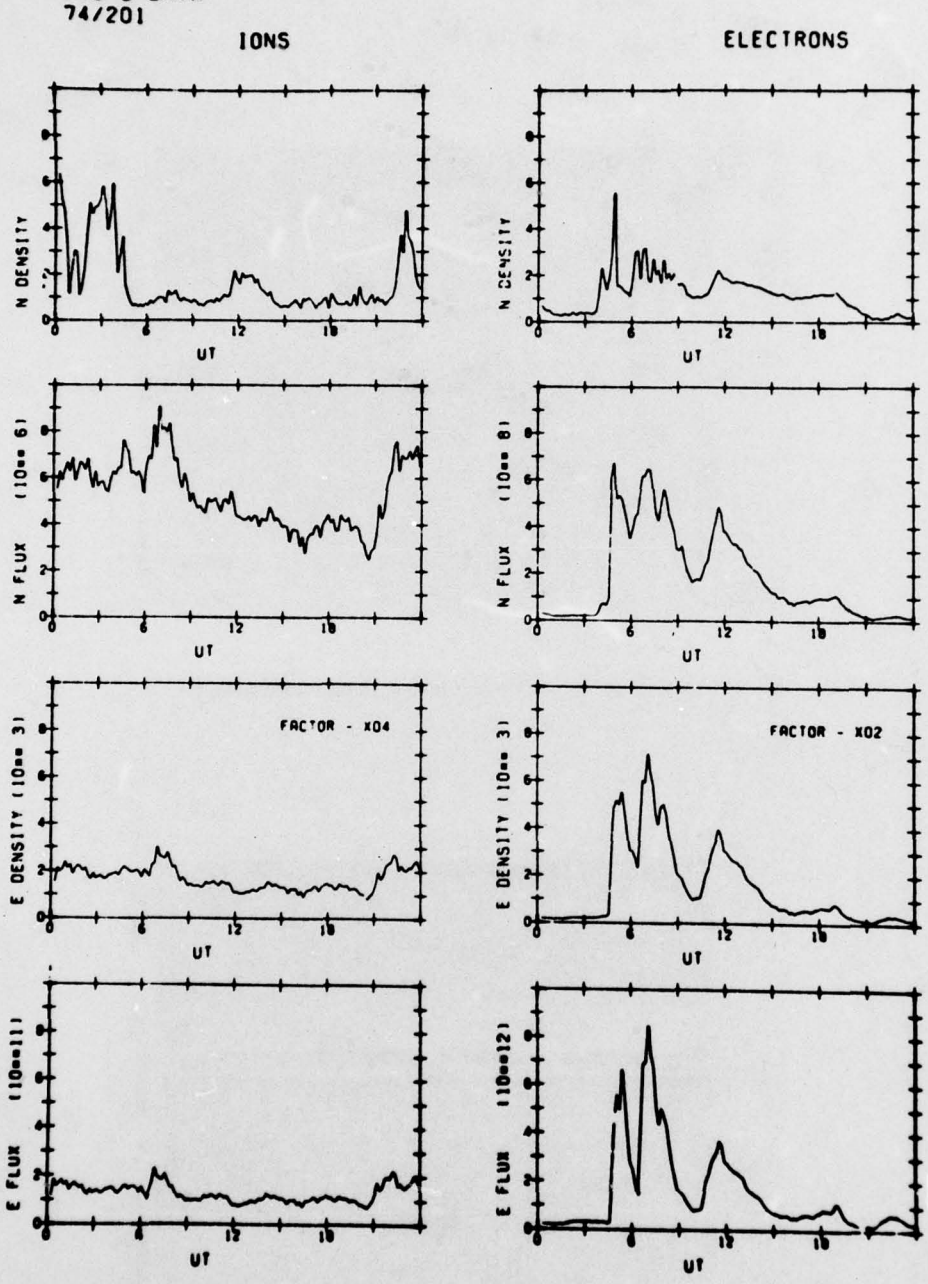

B
100-
INC
-90
45
0
-50-
7/18/74
10000
1000
100
10
0
10
100
1000
10000
0 1 2 3 4 5 6 7 8 9 10 11 12
UCSD.ATS-6
DAY 199 OF 1974

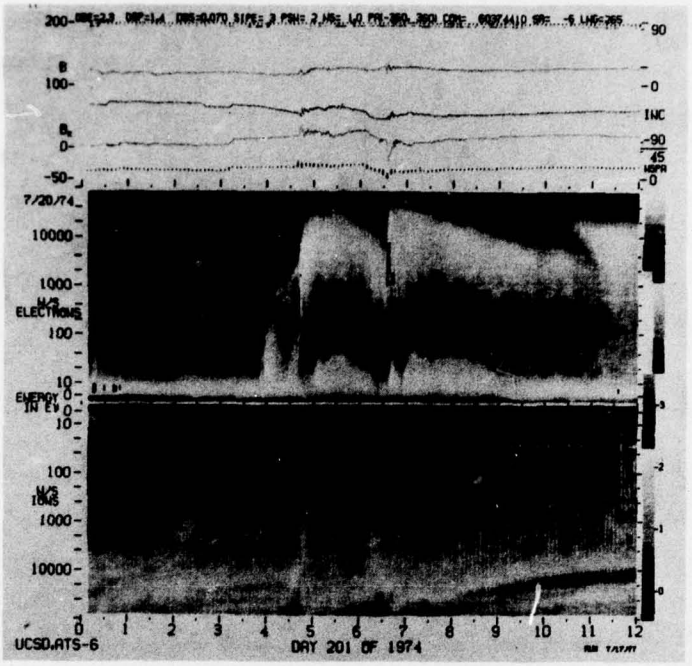

B
100-
INC
-90
45
0
-50-
7/18/74
10000
1000
100
10
0
10
100
1000
10000
12 13 14 15 16 17 18 19 20 21 22 23 24
UCSD.ATS-6
DAY 199 OF 1974


ATS-6 DATA
74/200
IONS
ELECTRONS
N DENSITY
N DENSITY (10** -1)
FACTOR - X04
N FLUX (10** 6)
N FLUX (10** 8)
E DENSITY (10** 3)
FACTOR - X04
E DENSITY (10** 3)
E FLUX (10**11)
E FLUX (10**12)
UT


B.
100-
B_x
0-
-50-
INC
-90
45
7/19/74
10000
1000
ELECTRONS
100
10
ENERGY
IN EV
IONS
0 1 2 3 4 5 6 7 8 9 10 11 12
UCSD,ATS-6
DAY 200 OF 1974


B
100-
B_x
0-
-50-
INC
-90
45
7/19/74
10000
1000
ELECTRONS
100
10
ENERGY
IN EV
IONS
12 13 14 15 16 17 18 19 20 21 22 23 24
UCSD,ATS-6
DAY 200 OF 1974


ATS-6 DATA
74/201
IONS
ELECTRONS
N DENSITY
N FLUX (10** 6)
N FLUX (10** 8)
E DENSITY (10** 3)
FACTOR - X04
FACTOR - X02
E FLUX (10**11)
E FLUX (10**12)
UT
0
6
12
18
2
4
8


B
100-
B_x
0-
-50-
INC
-90
45
7/20/74
10000-
1000-
ELECTRONS
100-
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ENERGY IN EV
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100-
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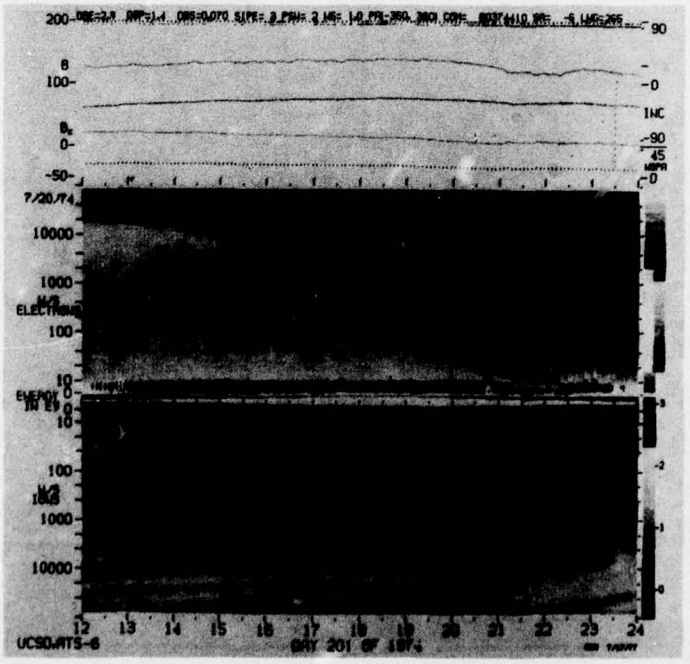
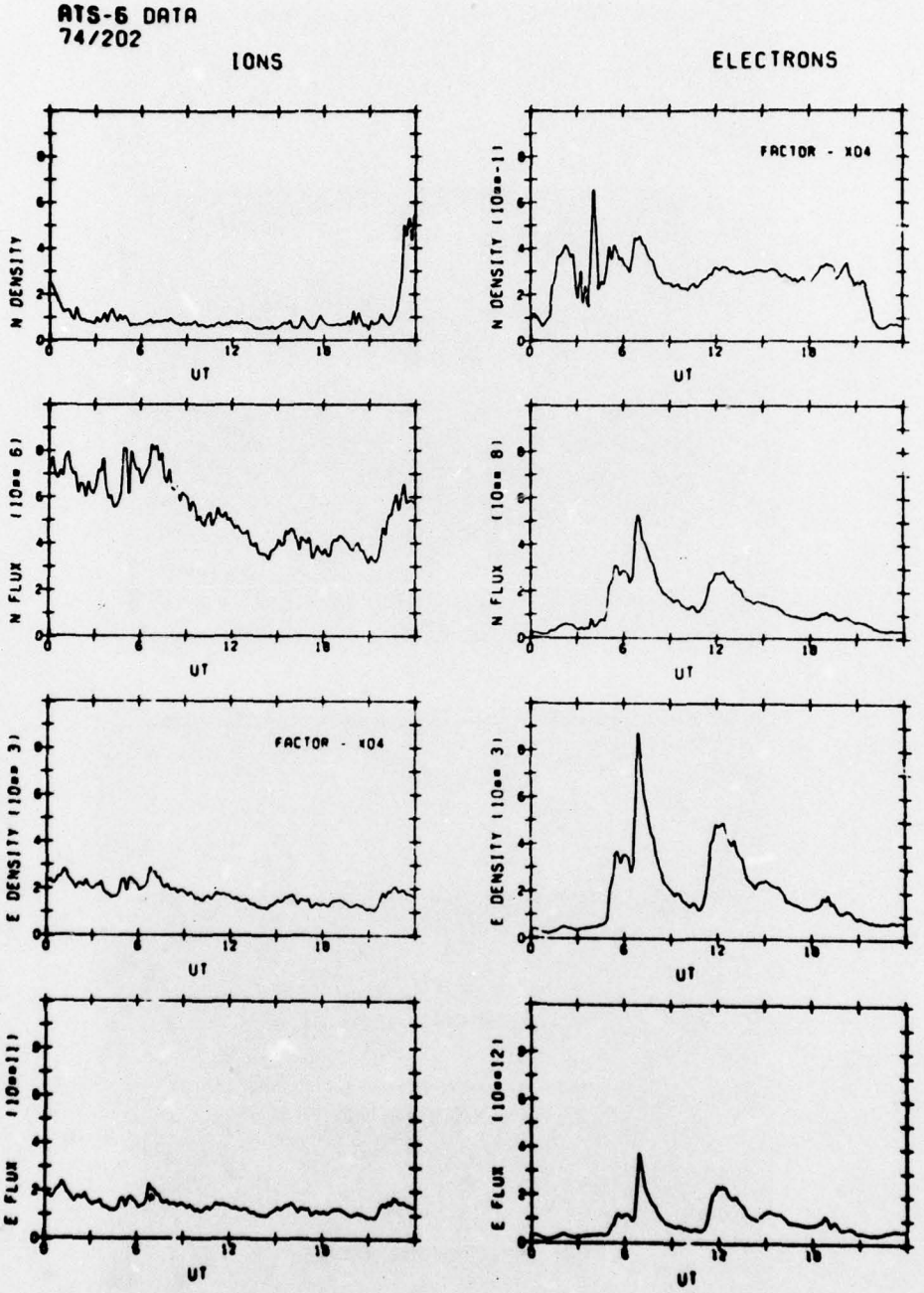
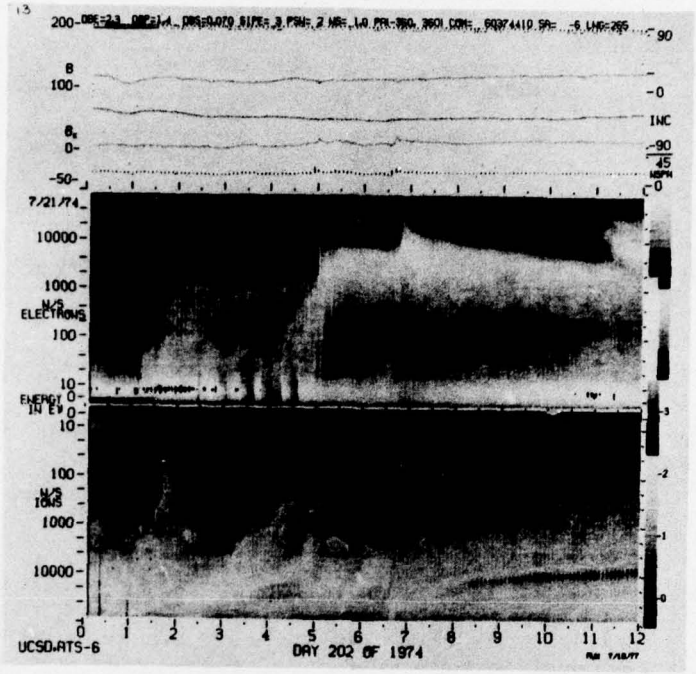
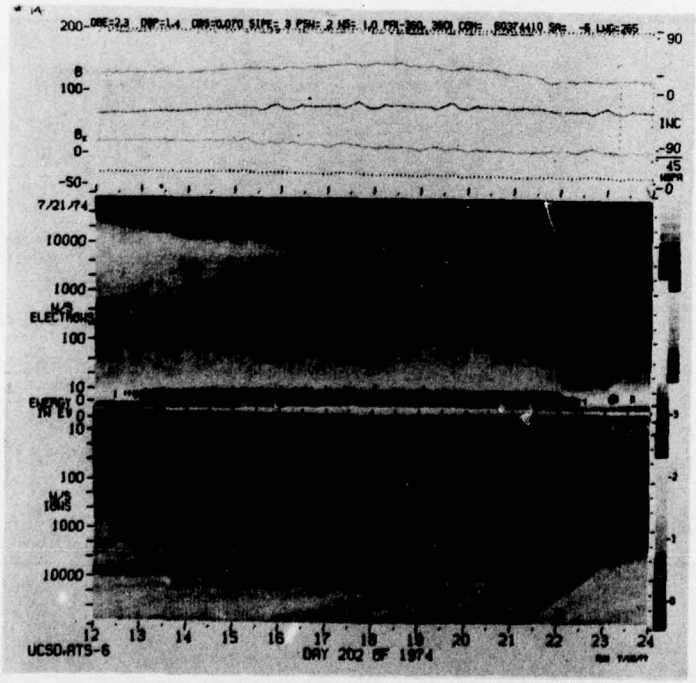
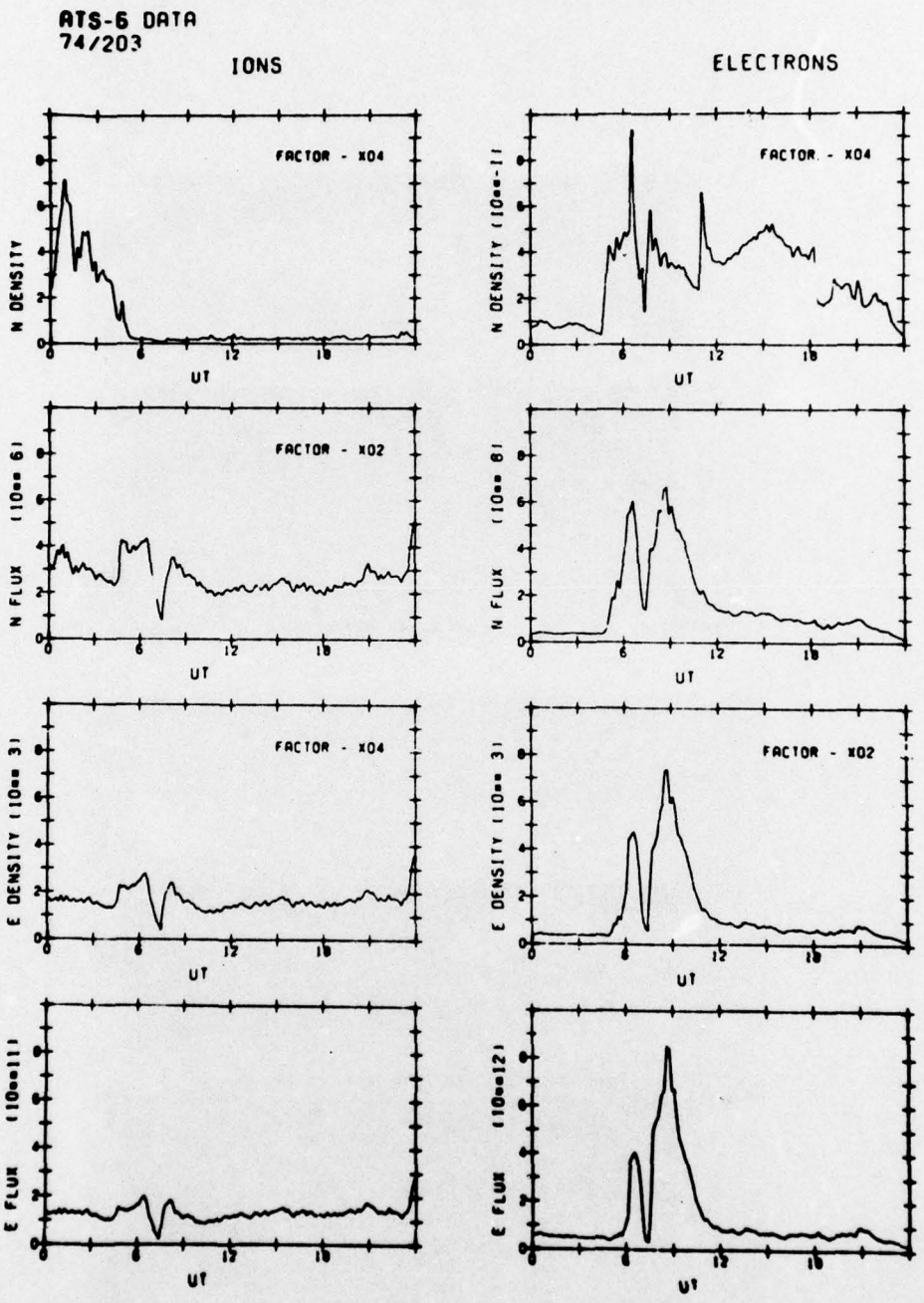
0 1 2 3 4 5 6 7 8 9 10 11 12
UCSD,ATS-6
DAY 201 OF 1974

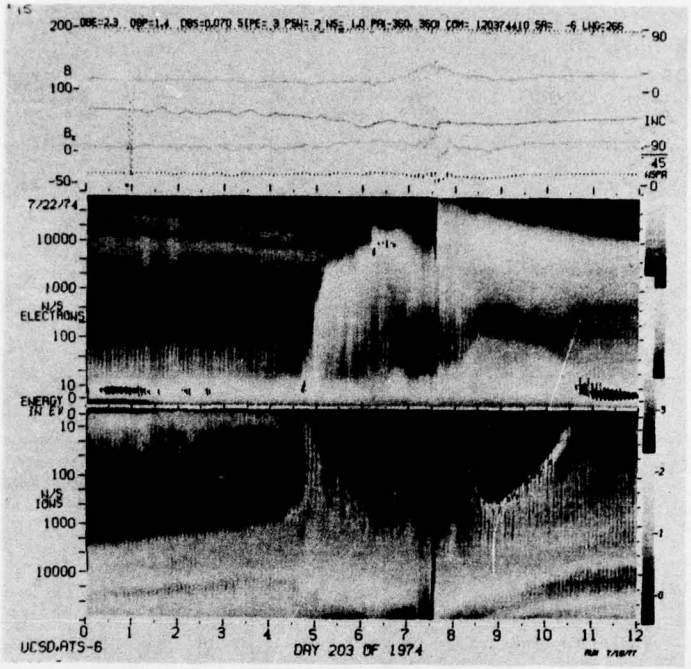

B
100-
B_x
0-
-50-
INC
-90
45
7/20/74
10000-
1000-
100-
10-
10-
100-
1000-
10000-
12 13 14 15 16 17 18 19 20 21 22 23 24
UCSD,ATS-6
DAY 201 OF 1974

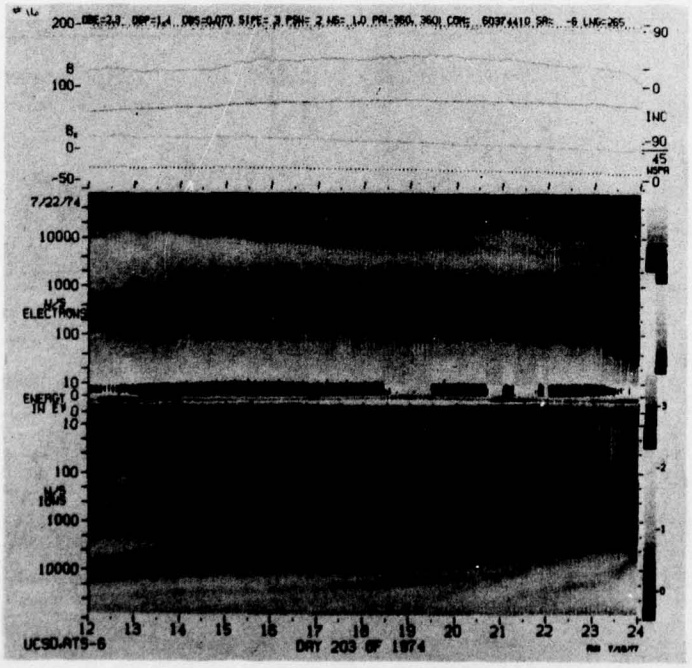

ATS-6 DATA
74/202
IONS
ELECTRONS
N DENSITY
N DENSITY (10** -1)
FACTOR - X04
N FLUX (10** 6)
N FLUX (10** 8)
E DENSITY (10** 3)
FACTOR - X04
E DENSITY (10** 3)
E FLUX (10**11)
E FLUX (10**12)
UT
0
6
12
18

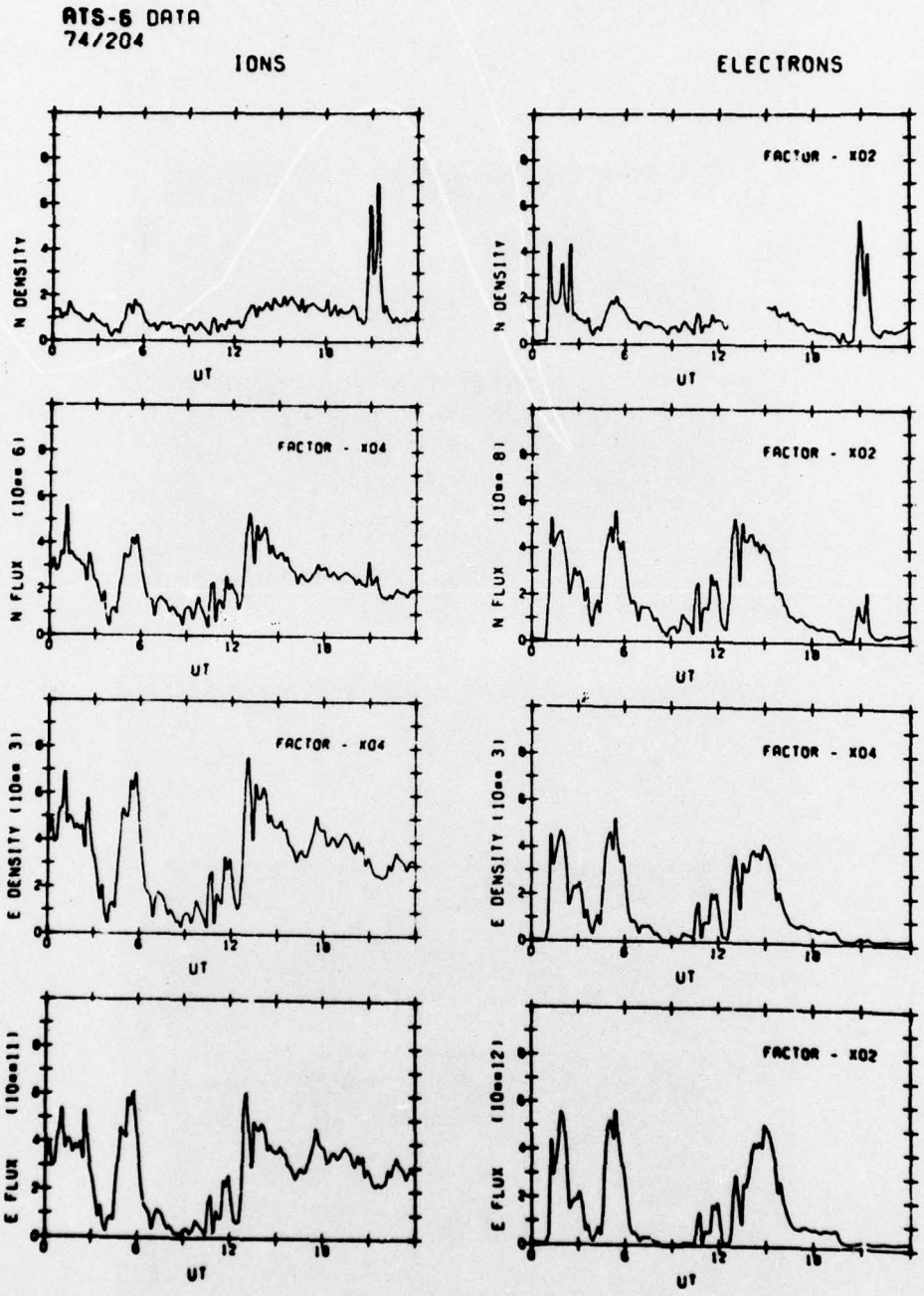

200-
90
B
100-
-0
INC
B_x
0-
-90
45
-50-
0
7/21/74
10000-
1000-
ELECTRONS
100-
10-
ENERGY
IN EV
0
10-
100-
IONS
1000-
10000-
-3
-2
-1
0
0 1 2 3 4 5 6 7 8 9 10 11 12
UCSD-ATS-6
DAY 202 OF 1974

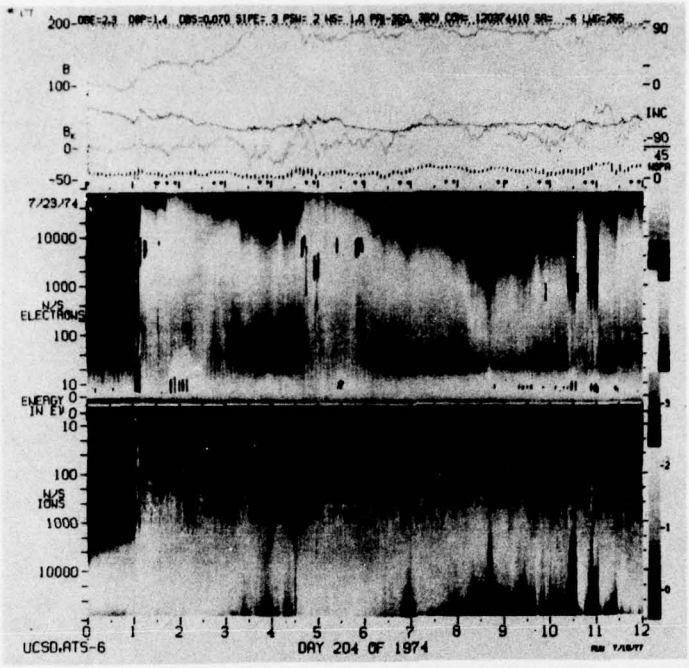

200-
90
B
100-
-0
INC
B_x
0-
-90
45
-50-
0
7/21/74
10000-
1000-
ELECTRONS
100-
10-
ENERGY
IN EV
0
10-
100-
IONS
1000-
10000-
-3
-2
-1
0
12 13 14 15 16 17 18 19 20 21 22 23 24
UCSD-ATS-6
DAY 202 OF 1974

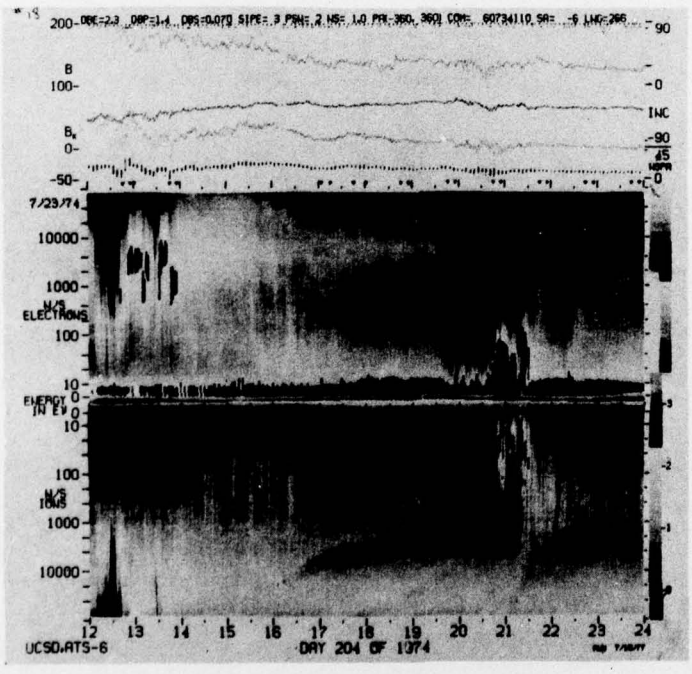

ATS-6 DATA
74/203
IONS
ELECTRONS
FACTOR - X04
FACTOR - X04
N DENSITY
N DENSITY (10**-1)
FACTOR - X02
N FLUX (10** 6)
N FLUX (10** 8)
FACTOR - X04
FACTOR - X02
E DENSITY (10** 3)
E DENSITY (10** 3)
E FLUX (10**11)
E FLUX (10**12)
UT
0
6
12
18
2
4
6
8

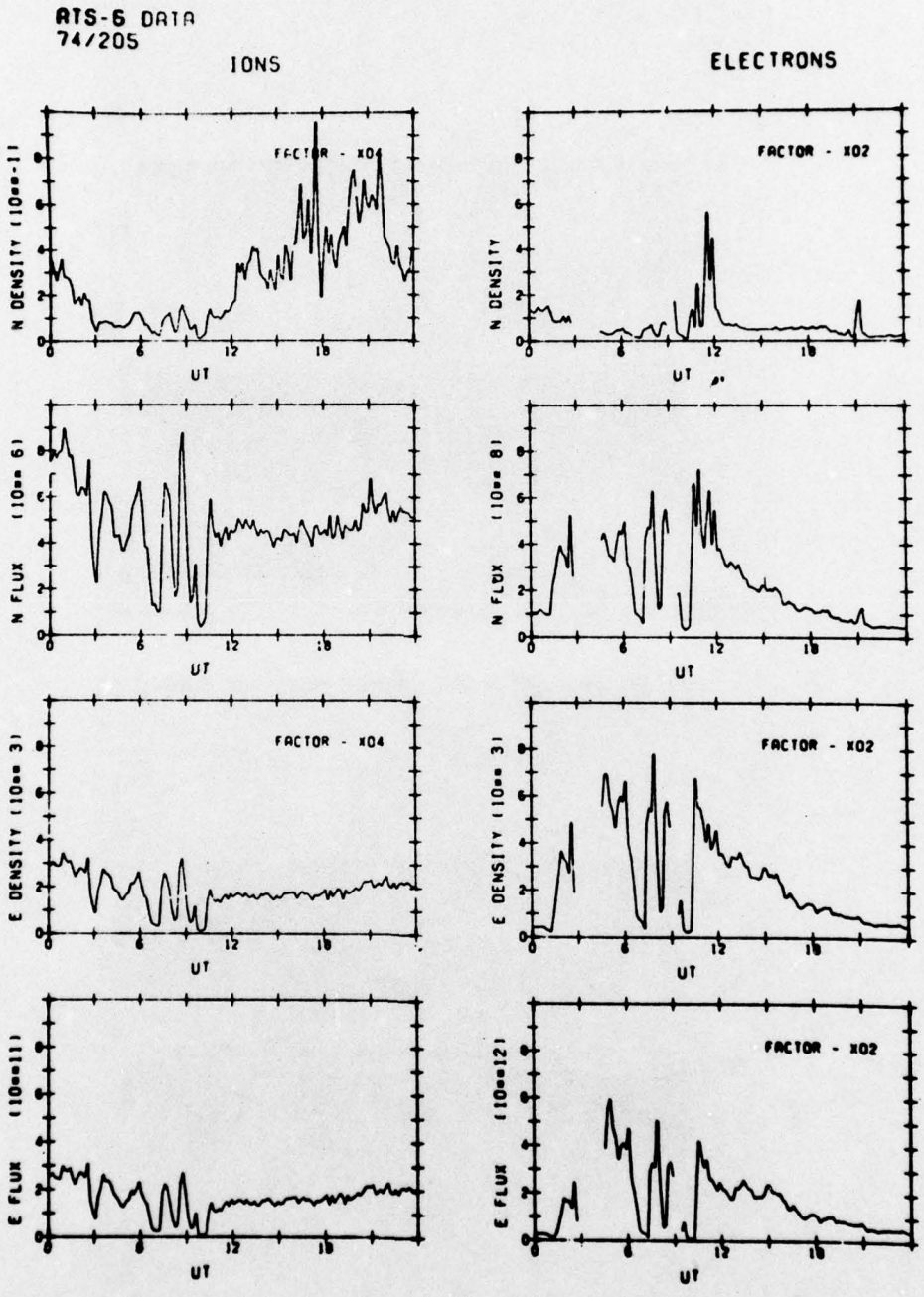

7/22/74
10000
1000
N/S
ELECTRONS
100
10
ENERGY
IN EV
100
N/S
IONS
1000
10000
INC
45
UCSD-ATS-6
DAY 203 OF 1974

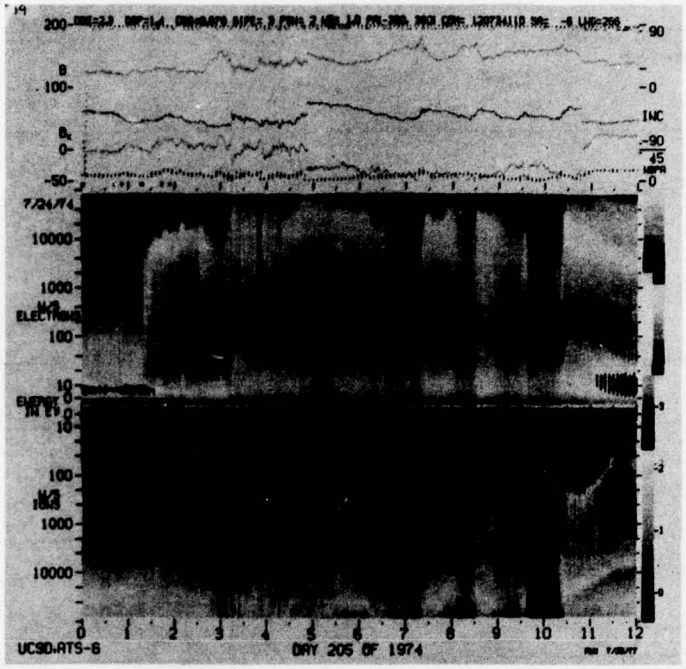

7/22/74
10000
1000
N/S
ELECTRONS
100
10
ENERGY
IN EV
100
N/S
IONS
1000
10000
INC
45
UCSD-ATS-6
DAY 203 OF 1974

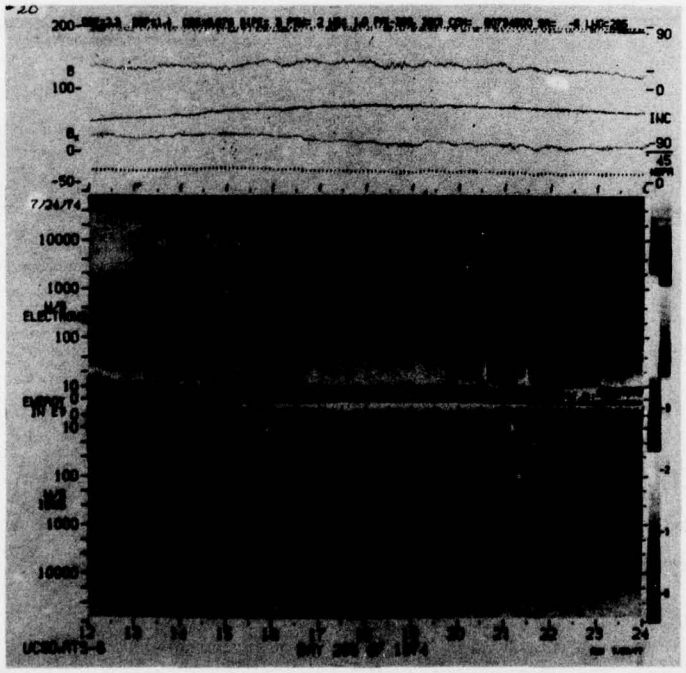

ATS-6 DATA
74/204
IONS
ELECTRONS
N DENSITY
FACTOR - X02
UT
N FLUX (10** 6)
FACTOR - X04
N FLUX (10** 8)
FACTOR - X02
E DENSITY (10** 3)
FACTOR - X04
E DENSITY (10** 3)
FACTOR - X04
E FLUX (10**11)
E FLUX (10**12)
FACTOR - X02
0
6
12
18

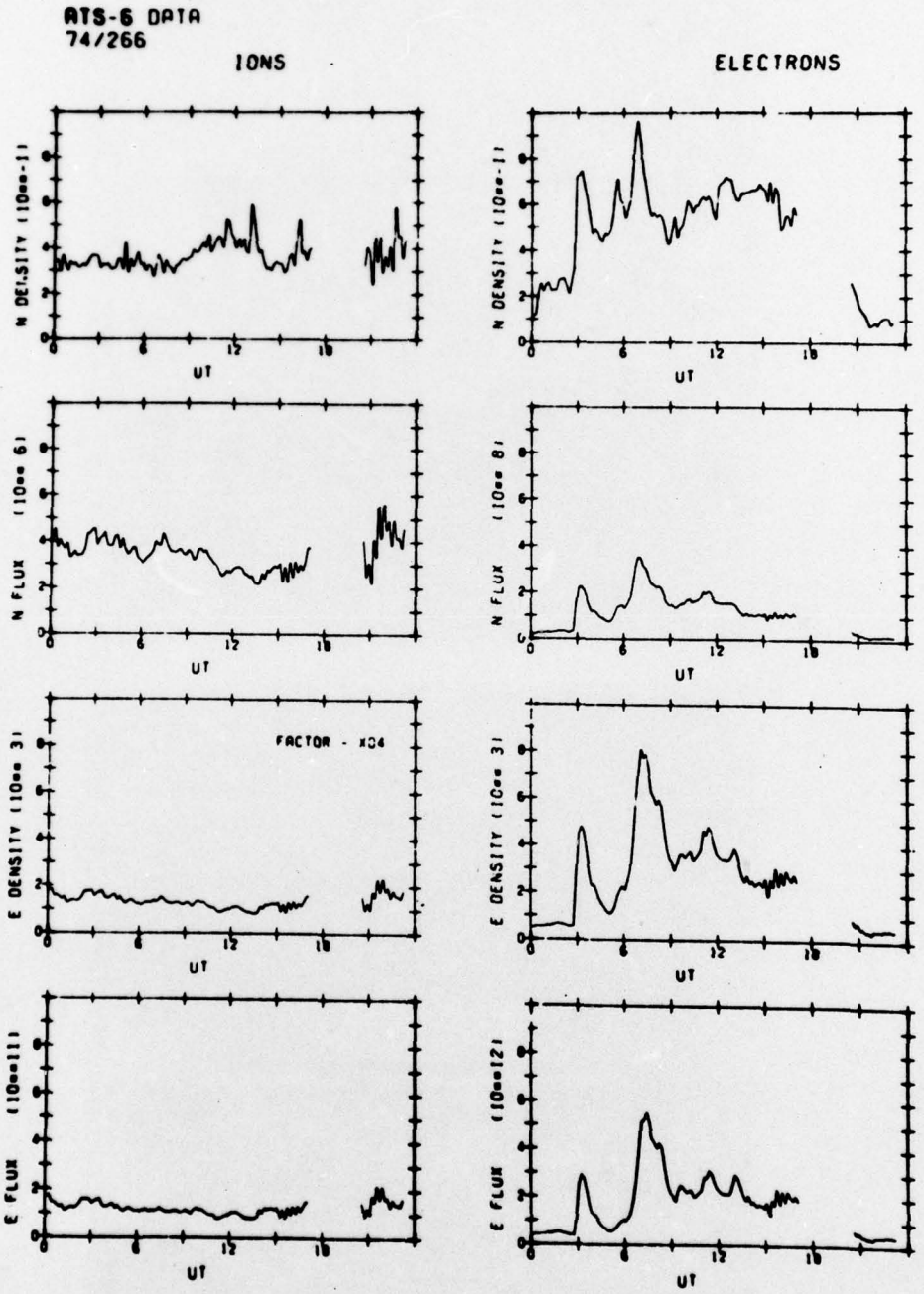

B
100-
B_x
0-
-50-
INC
90
0
-90
45
7/23/74
10000
1000
N/S
ELECTRONS
100
10
ENERGY
IN EV
0
10
100
N/S
IONS
1000
10000
0 1 2 3 4 5 6 7 8 9 10 11 12
UCSD,ATS-6
DAY 204 OF 1974

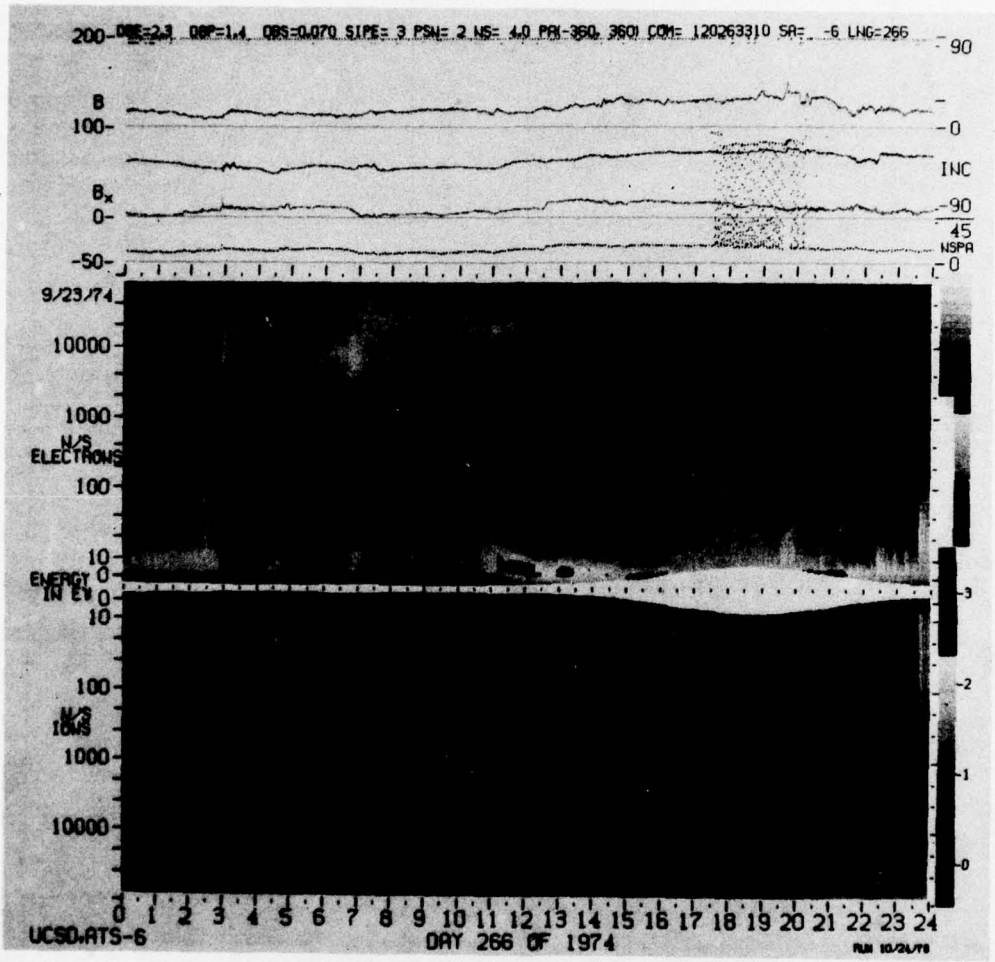

B
100-
B_x
0-
-50-
INC
90
0
-90
45
7/23/74
10000
1000
N/S
ELECTRONS
100
10
ENERGY
IN EV
0
10
100
N/S
IONS
1000
10000
12 13 14 15 16 17 18 19 20 21 22 23 24
UCSD,ATS-6
DAY 204 OF 1974

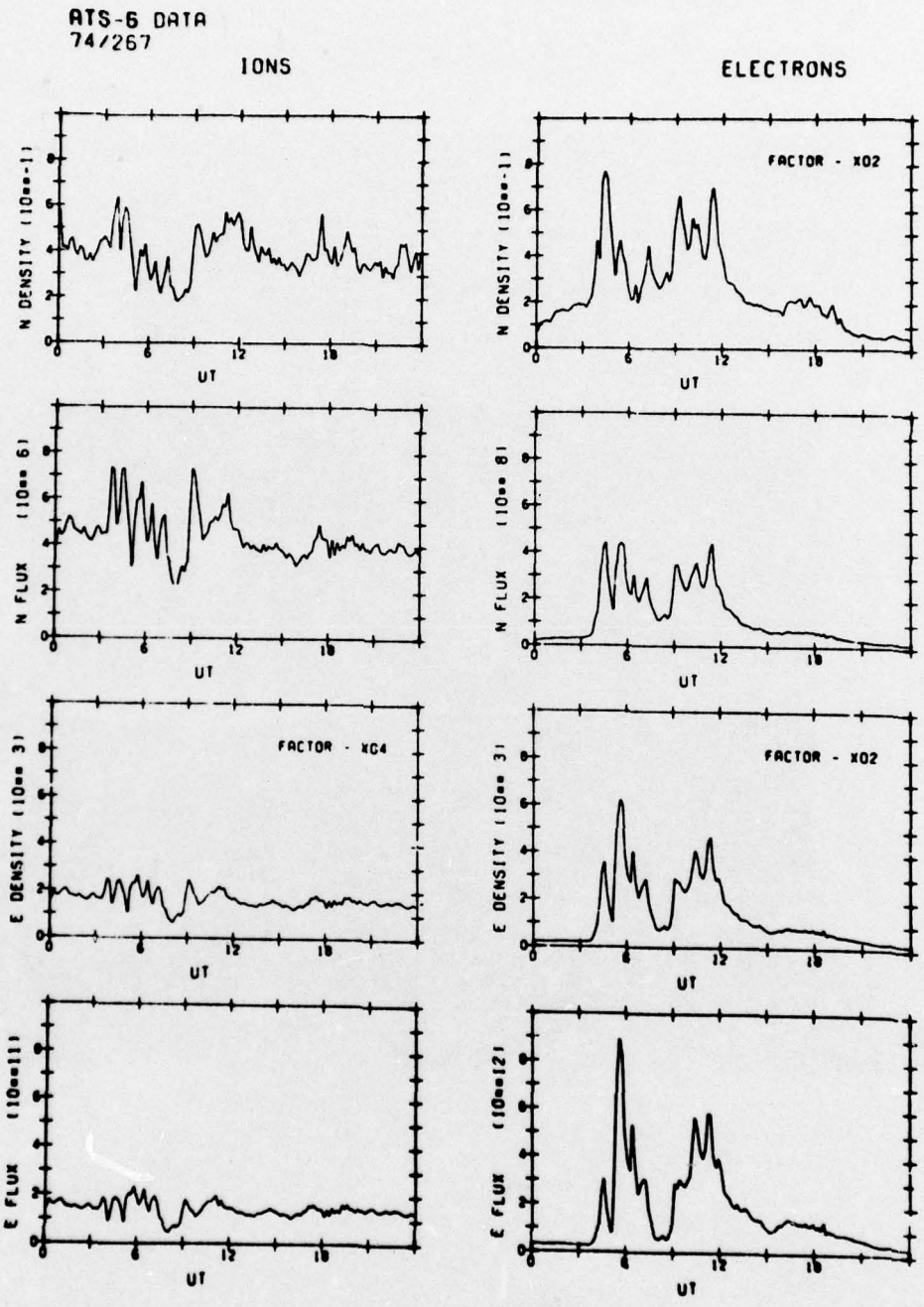

ATS-6 DATA
74/205
IONS
ELECTRONS
N DENSITY (10**-1)
FACTOR - X04
FACTOR - X02
N DENSITY
UT
N FLUX (10** 6)
N FLUX (10** 8)
E DENSITY (10** 3)
E DENSITY (10** 3)
E FLUX (10**11)
E FLUX (10**12)
0
6
12
18

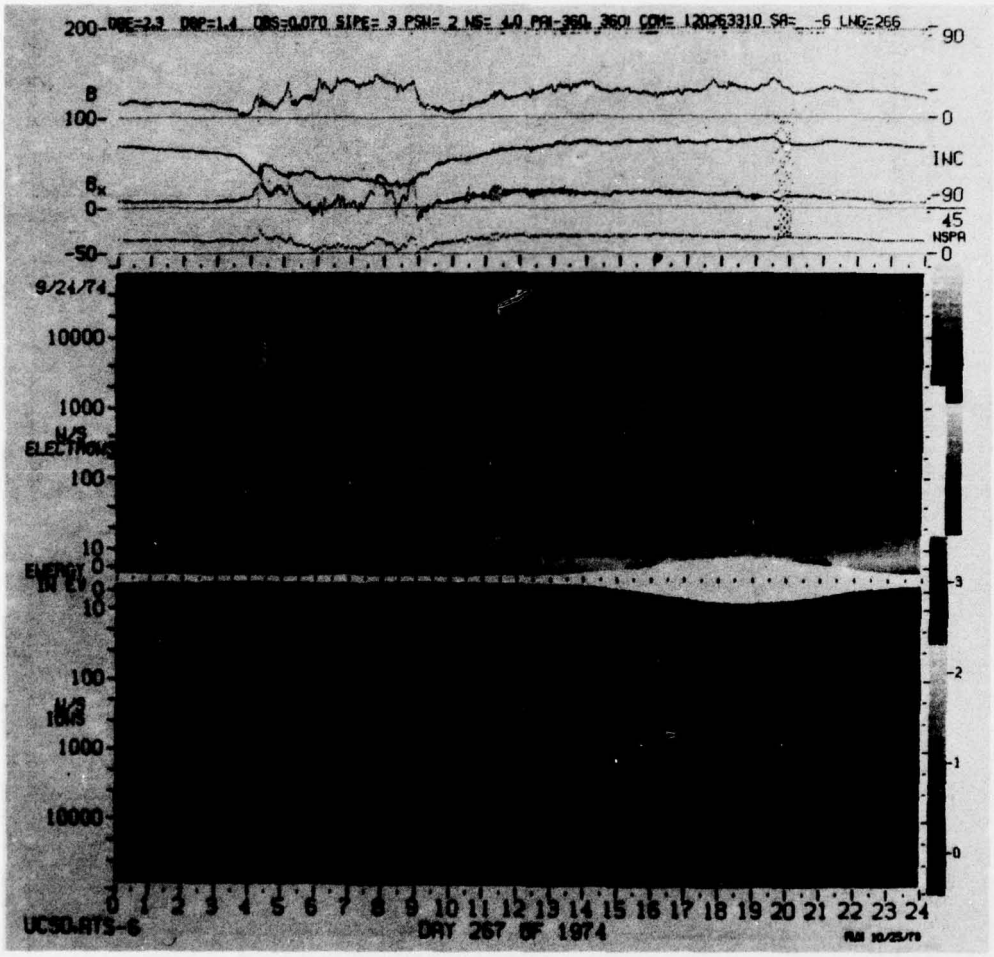

200
B
100
B_z
0
-50
90
0
INC
-90
45
0
7/24/74
10000
1000
100
10
100
1000
10000
0 1 2 3 4 5 6 7 8 9 10 11 12
UCSD.ATS-6
DAY 205 OF 1974

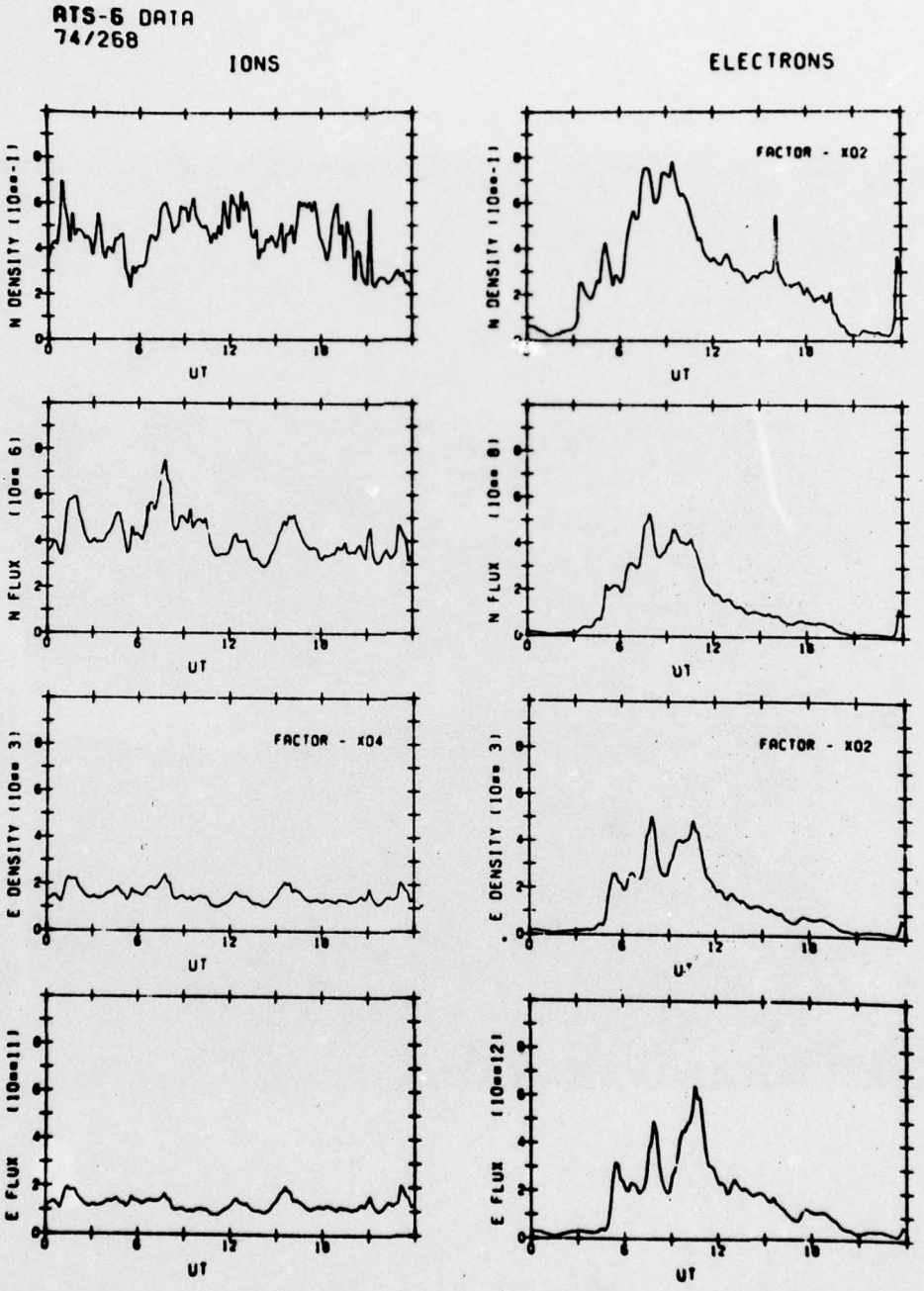

200
B
100
B_z
0
-50
90
0
INC
-90
45
0
7/24/74
10000
1000
100
10
100
1000
10000
UCSD.ATS-6

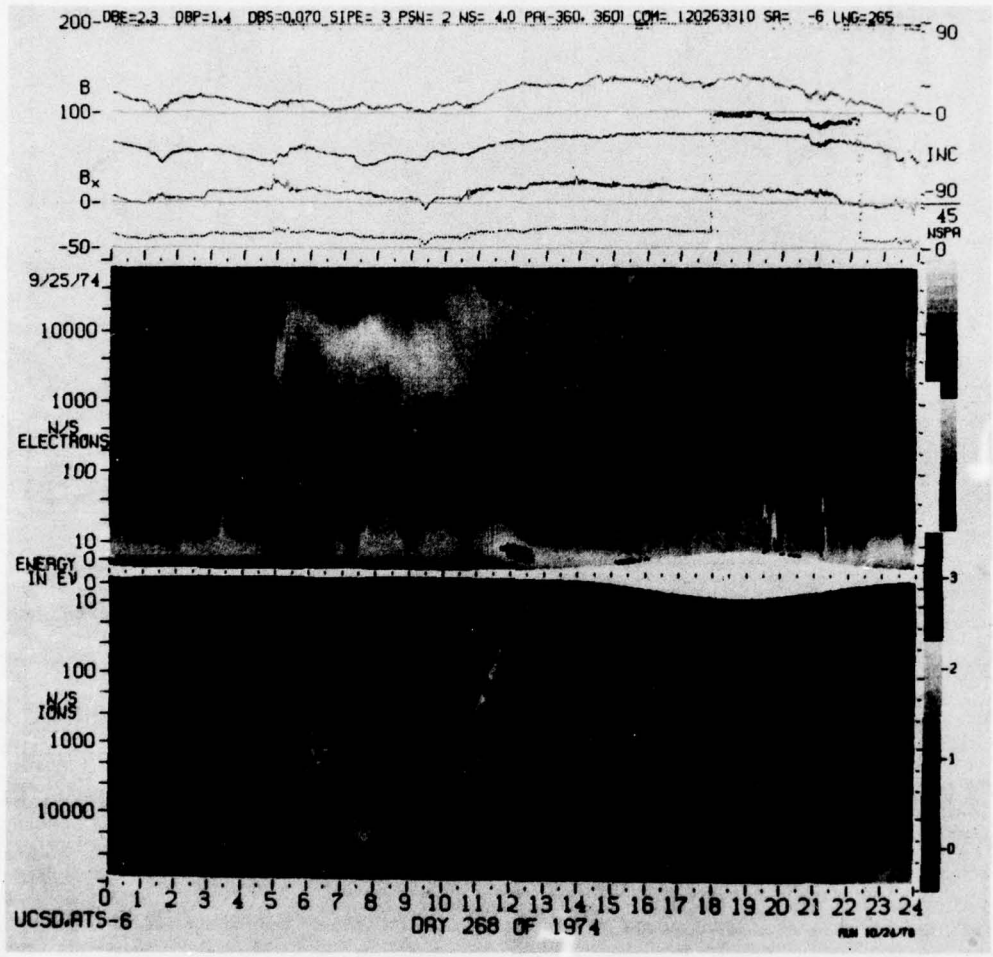

ATS-6 DATA
74/266
IONS
ELECTRONS
N DENSITY (10**-1)
N FLUX (10** 6)
N FLUX (10** 8)
E DENSITY (10** 3)
FACTOR - X04
E FLUX (10**11)
E FLUX (10**12)
UT
0
6
12
18

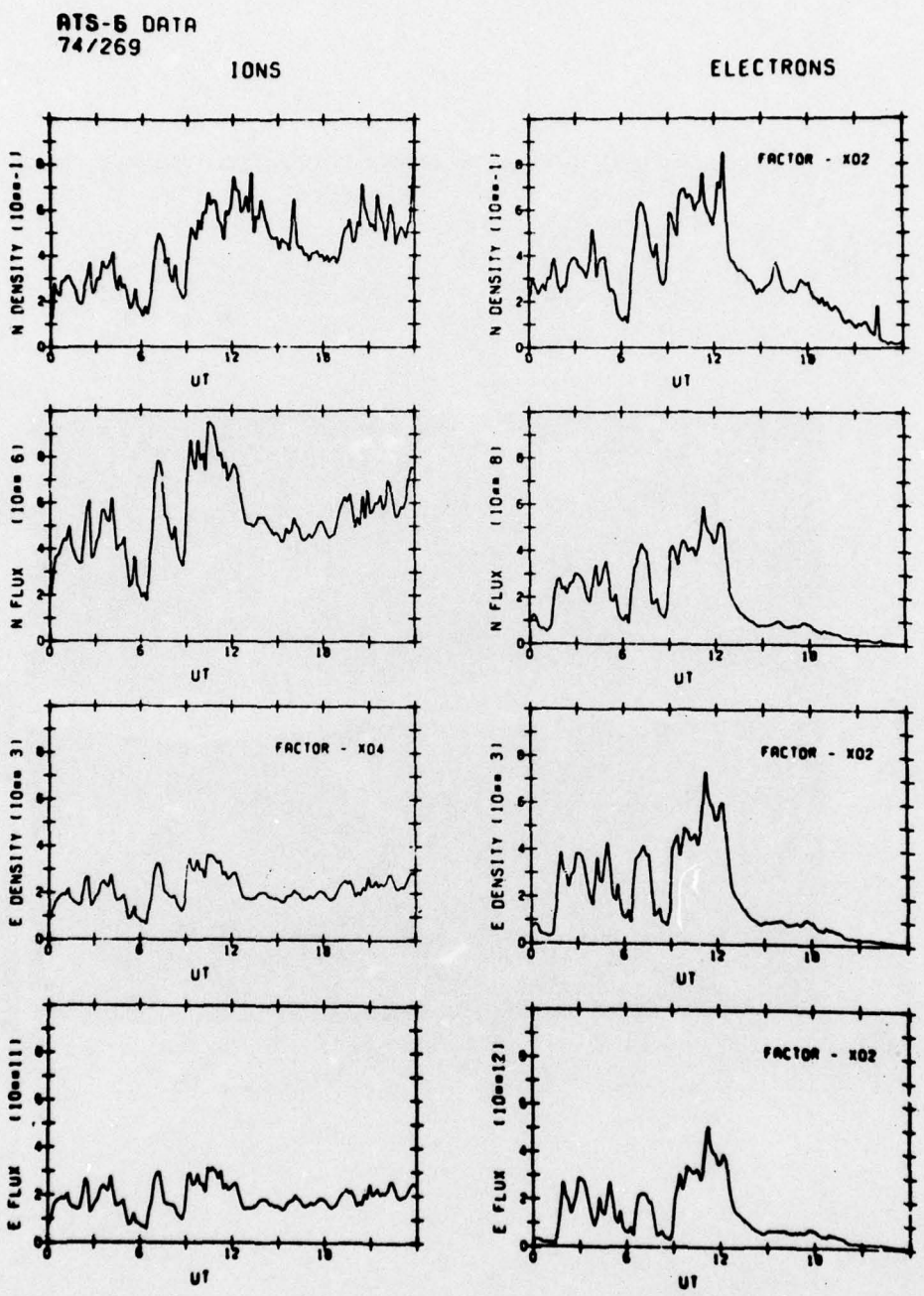

200-
B
100-
B_x
0-
-50-
9/23/74
10000
1000
N/S
ELECTRONS
100
10
ENERGY
IN EV
0
10
100
N/S
IONS
1000
10000
90
0
INC
-90
45
NSPA
0
3
2
1
0
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24
UCSD-ATS-6
DAY 266 OF 1974

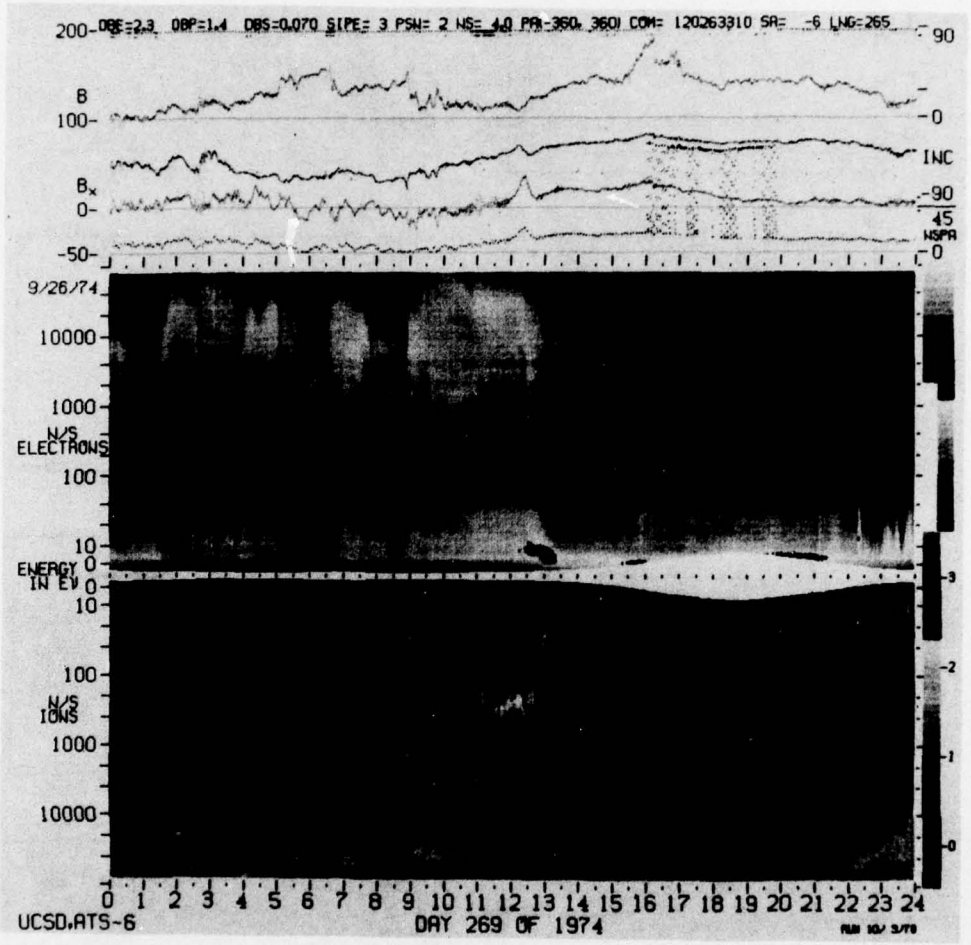

ATS-6 DATA
74/267
IONS
ELECTRONS
N DENSITY (10**-1)
FACTOR - X02
UT
N FLUX (10** 6)
N FLUX (10** 8)
E DENSITY (10** 3)
FACTOR - X04
FACTOR - X02
E FLUX (10**11)
E FLUX (10**12)
0
6
12
18

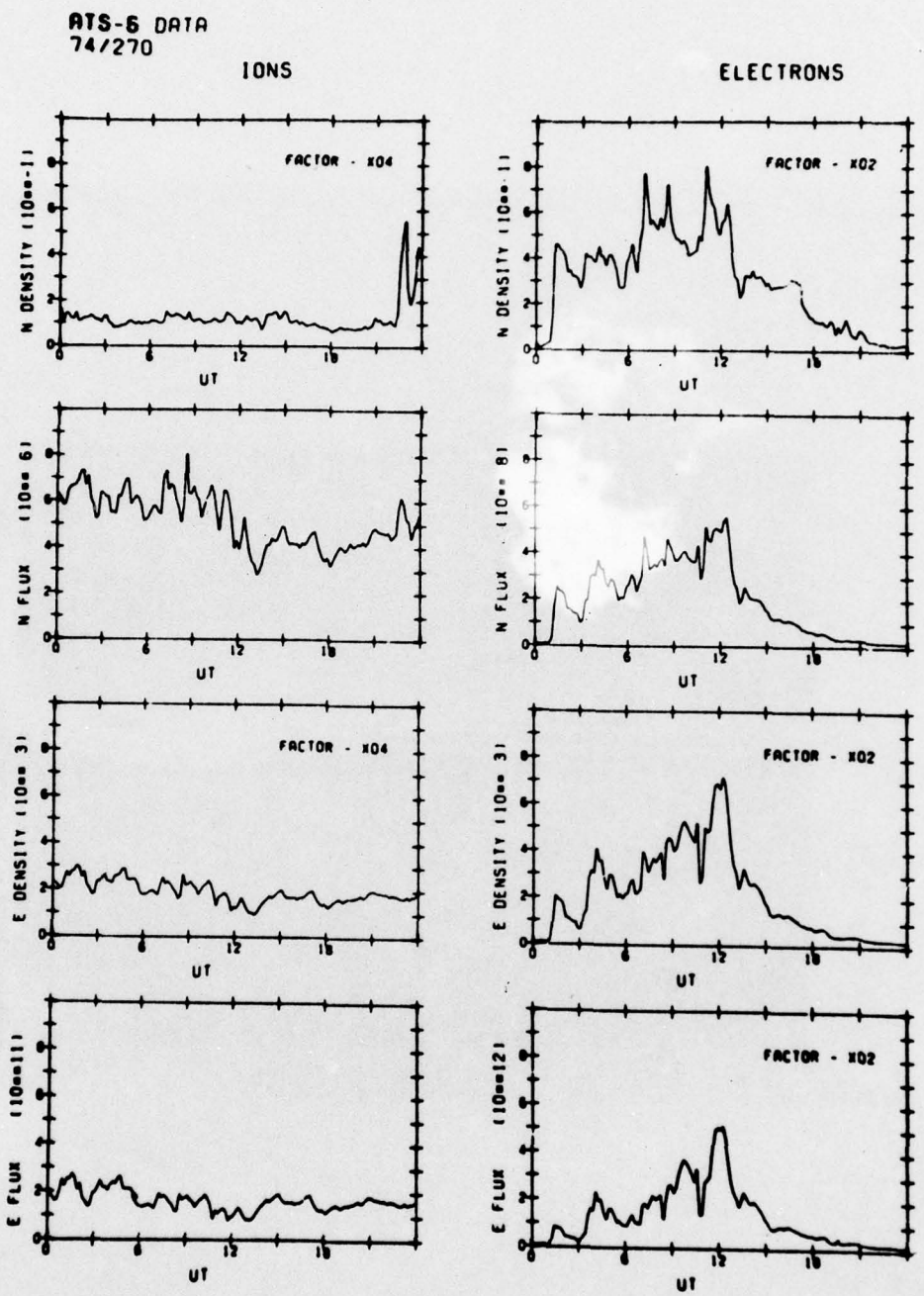

200-
B
100-
B_N
0-
-50-
INC
90
0
-90
45
NSPR
0
9/24/74
10000
1000
ELECTRONS
100
10
ENERGY
IN EV
0
10
100
IONS
1000
10000
-3
-2
-1
-0
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24
UCSD-ATS-6
DAY 267 OF 1974

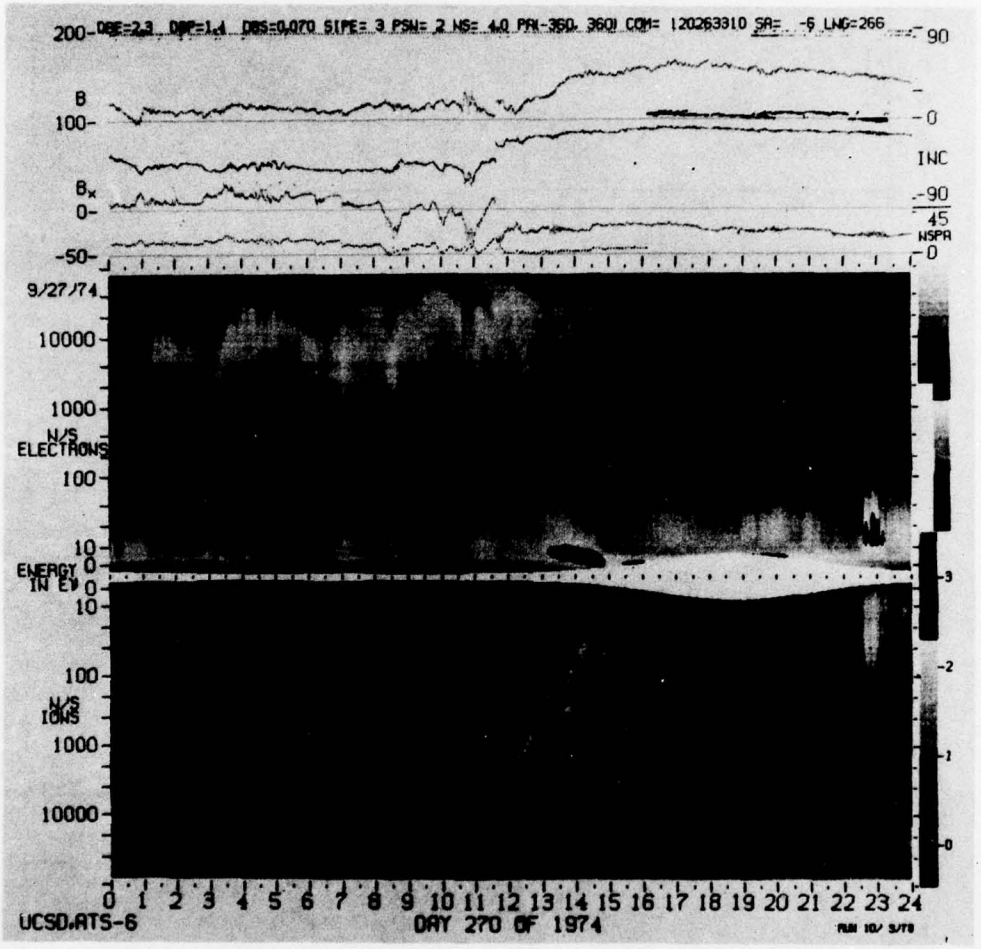

ATS-6 DATA
74/268
IONS
ELECTRONS
N DENSITY (10**-1)
FACTOR - X02
UT
N FLUX (10** 6)
N FLUX (10** 8)
E DENSITY (10** 3)
FACTOR - X04
FACTOR - X02
E FLUX (10**11)
E FLUX (10**12)
0
6
12
18


200
DBE=2.3 DBP=1.4 DBS=0.070 SIPE= 3 PSN= 2 NS= 4.0 PA(-360. 360) COM= 120263310 SA= -6 LNG=265
90
B
100
0
INC
B_x
0
-90
45
-50
WSPA
0
9/25/74
10000
1000
N/S
ELECTRONS
100
10
ENERGY
IN EV
0
0
10
100
N/S
IONS
1000
10000
3
2
1
0
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24
UCSD.ATS-6
DAY 268 OF 1974

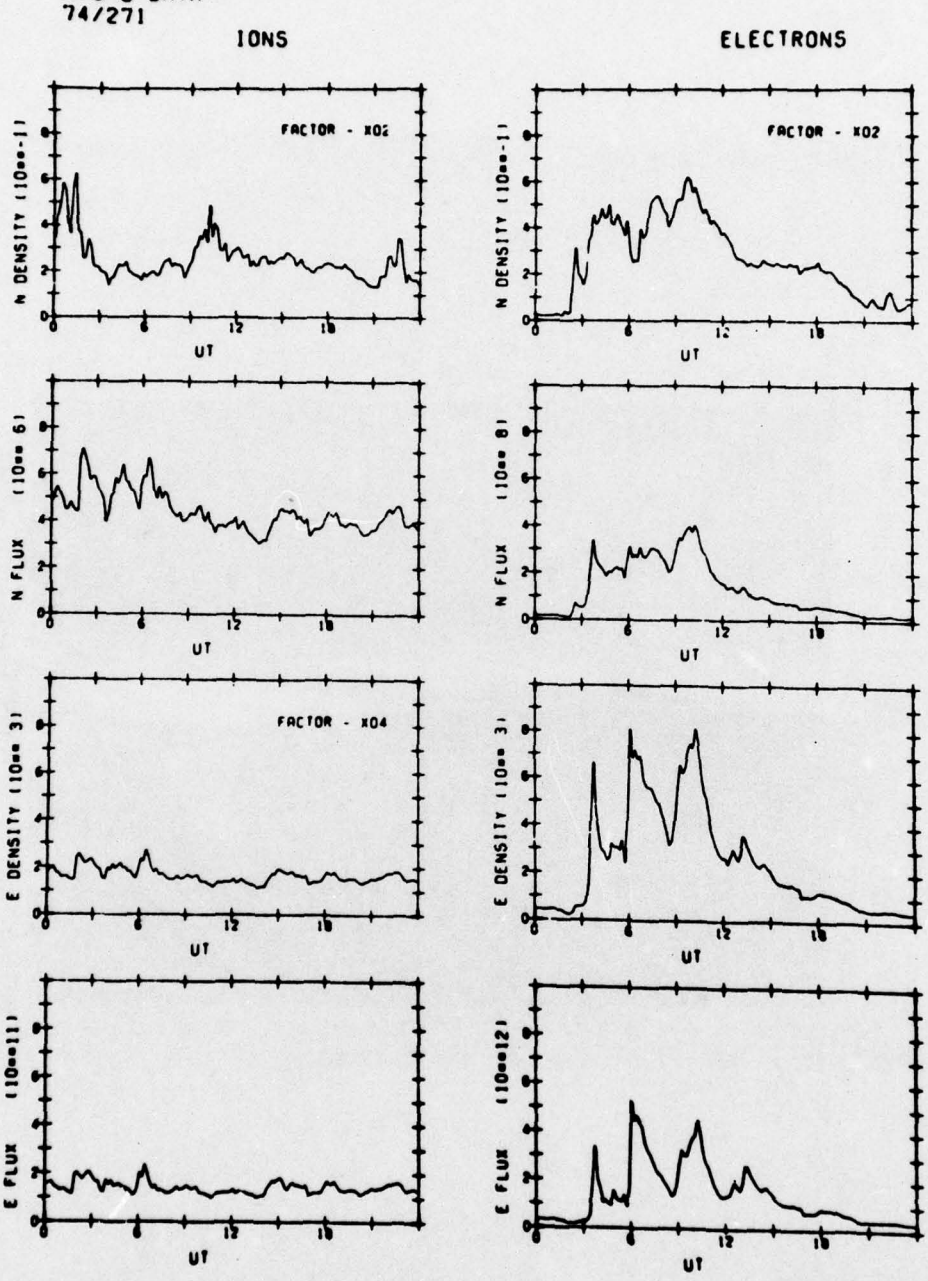

ATS-6 DATA
74/269
IONS
ELECTRONS
N DENSITY (10**-1)
FACTOR - X02
N FLUX (10** 6)
N FLUX (10** 8)
E DENSITY (10** 3)
FACTOR - X04
FACTOR - X02
E FLUX (10**11)
E FLUX (10**12)
FACTOR - X02
UT

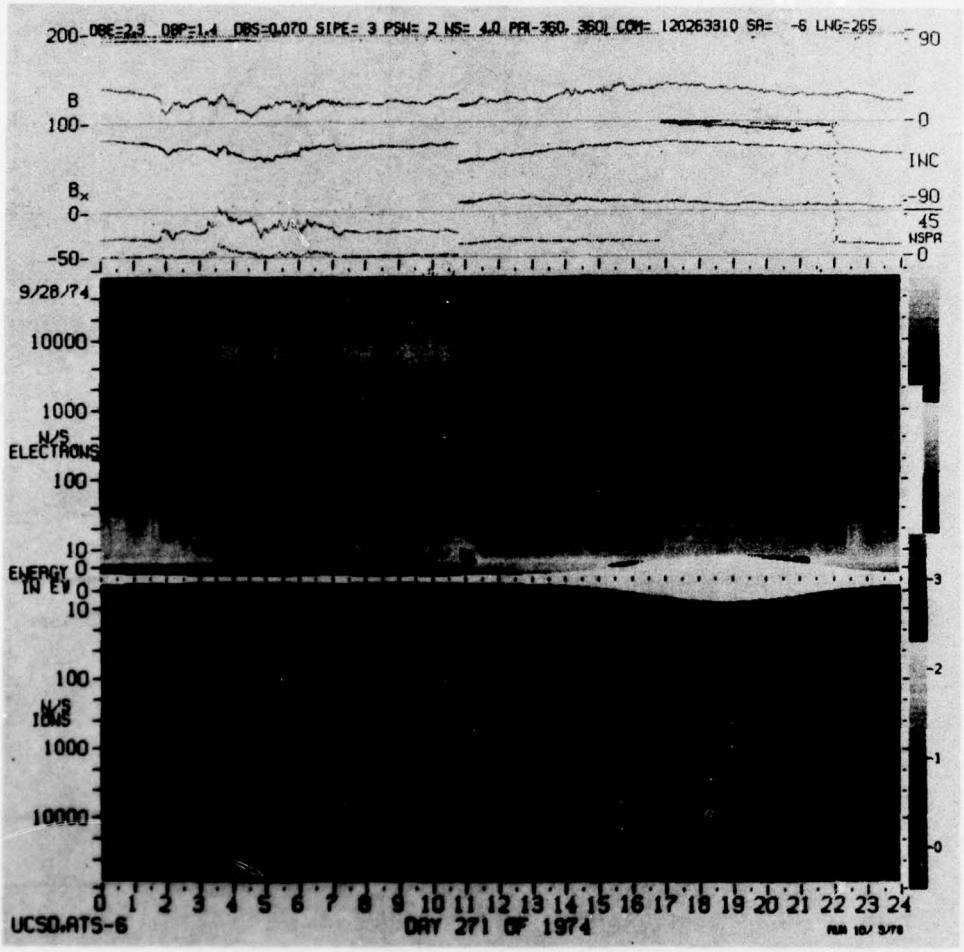

200-
B
100-
Bx
0-
-50-
9/26/74
10000
1000
N/S
ELECTRONS
100
10
ENERGY
IN EV
0
0
10
100
N/S
IONS
1000
10000
90
0
INC
-90
45
NSPR
0
-3
-2
-1
-0
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24
UCSD,ATS-6
DAY 269 OF 1974


ATS-6 DATA
74/270
IONS
ELECTRONS
FACTOR - X04
FACTOR - X02
N DENSITY (10**-1)
N FLUX (10** 6)
N FLUX (10** 8)
E DENSITY (10** 3)
E FLUX (10**11)
E FLUX (10**12)
UT

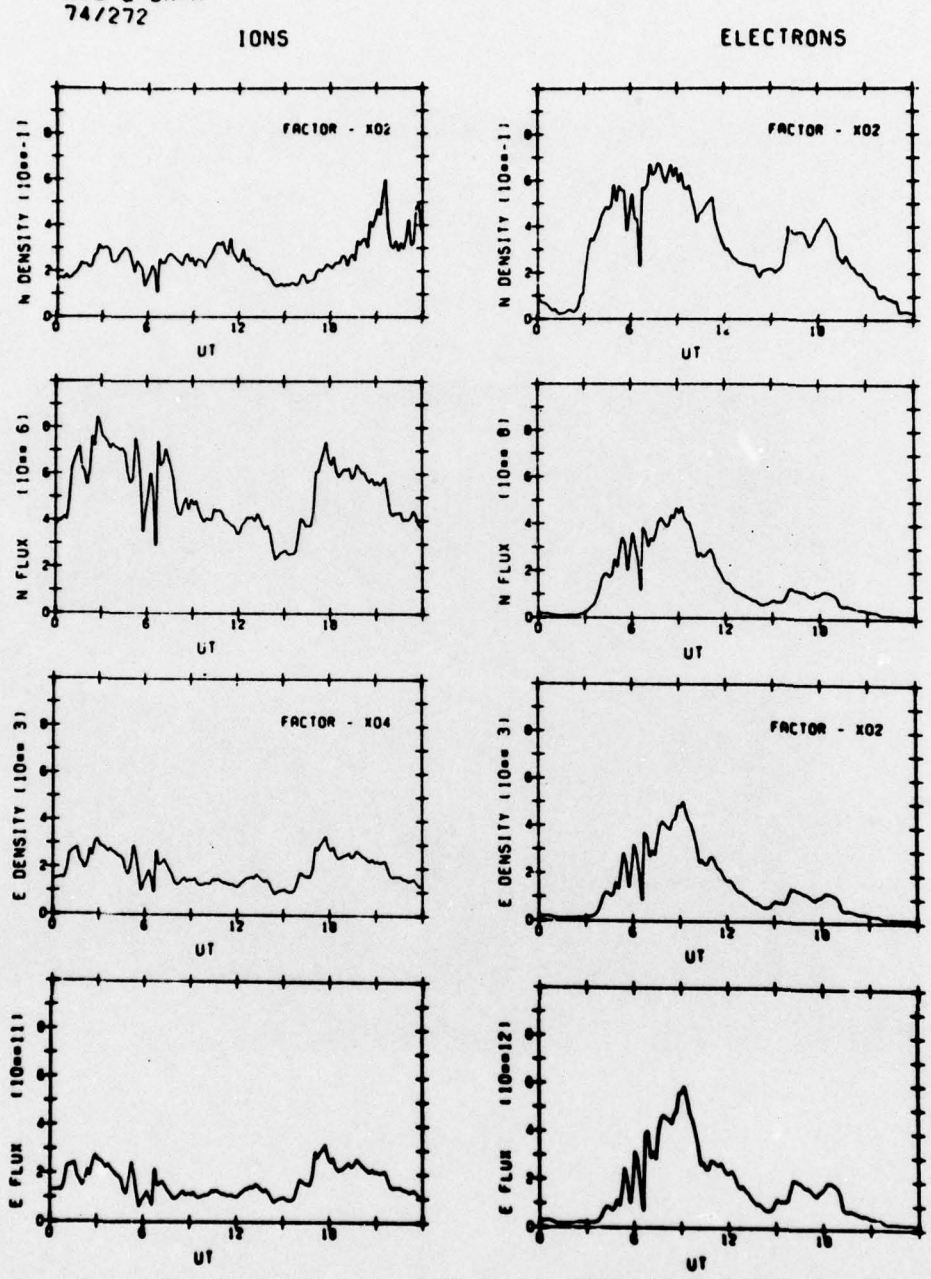

200-
DBE=2.3 DBP=1.4 DBS=0.070 SIPE= 3 PSW= 2 NS= 40 PAN=360, 360) COM= 120263310 SA= -6 LNG=266
90
B
100-
-0
INC
Bx
0-
-90
45
WSPR
-50-
0
9/27/74
10000
1000
N/S
ELECTRONS
100
10
ENERGY
IN EV
0
0
10
100
N/S
IONS
1000
10000
-3
-2
-1
-0
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24
UCSD.ATS-6
DAY 270 OF 1974

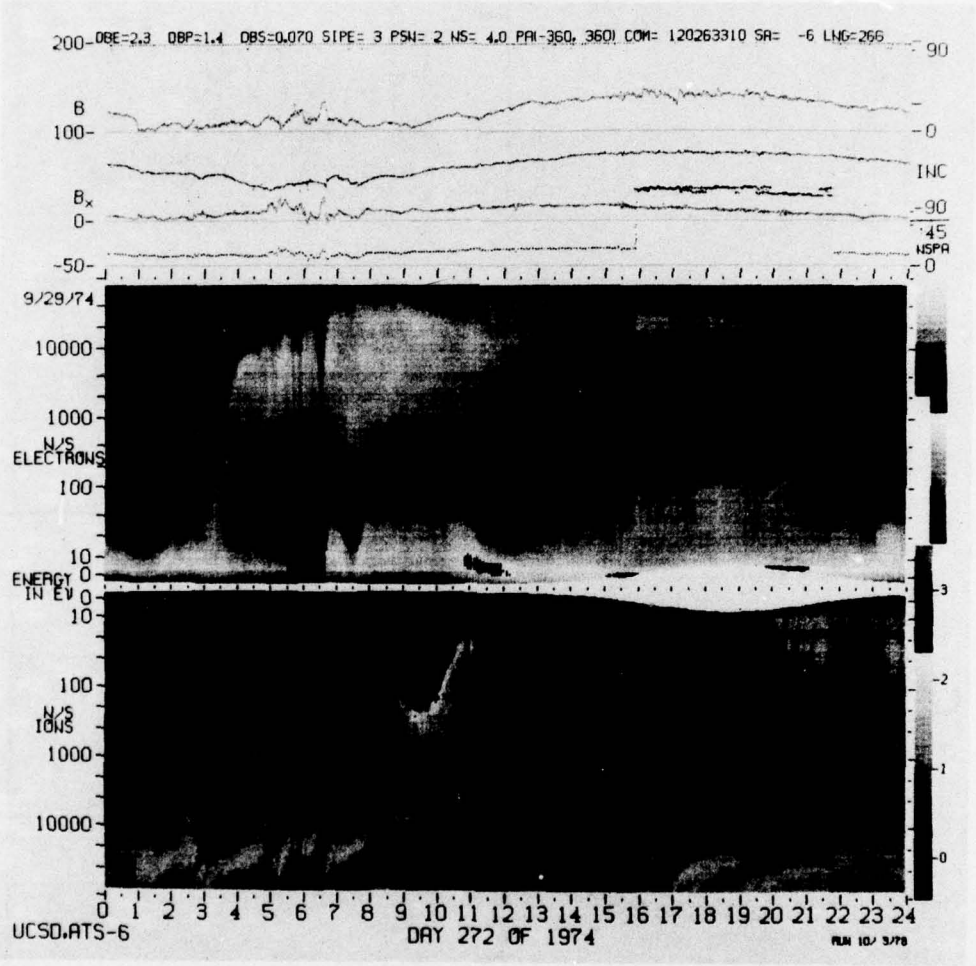
ATS-6 DATA
74/271



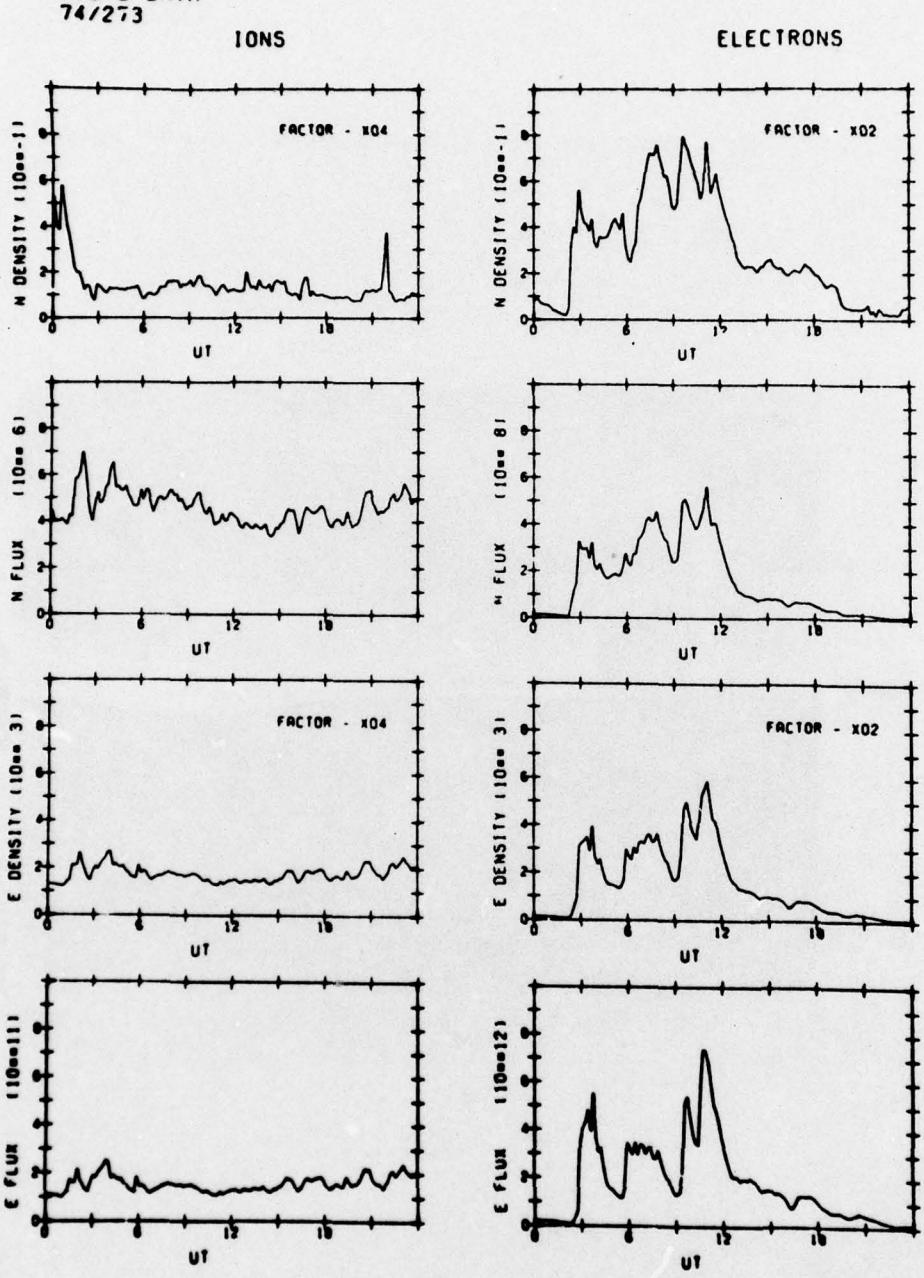

200-
DBE=2.3 DBP=1.4 DBS=0.070 SIPE= 3 PSW= 2 NS= 4.0 PAR-360, 360] COM= 120263310 SA= -6 LNG=265
90
B
100-
0
INC
B_x
0-
-90
45
NSPR
-50-
0
9/28/74
10000
1000
N/S
ELECTRONS
100
10
ENERGY
IN EV
0
0
10
100
N/S
IONS
1000
10000
-3
-2
-1
-0
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24
UCSD.ATS-6
DAY 271 OF 1974

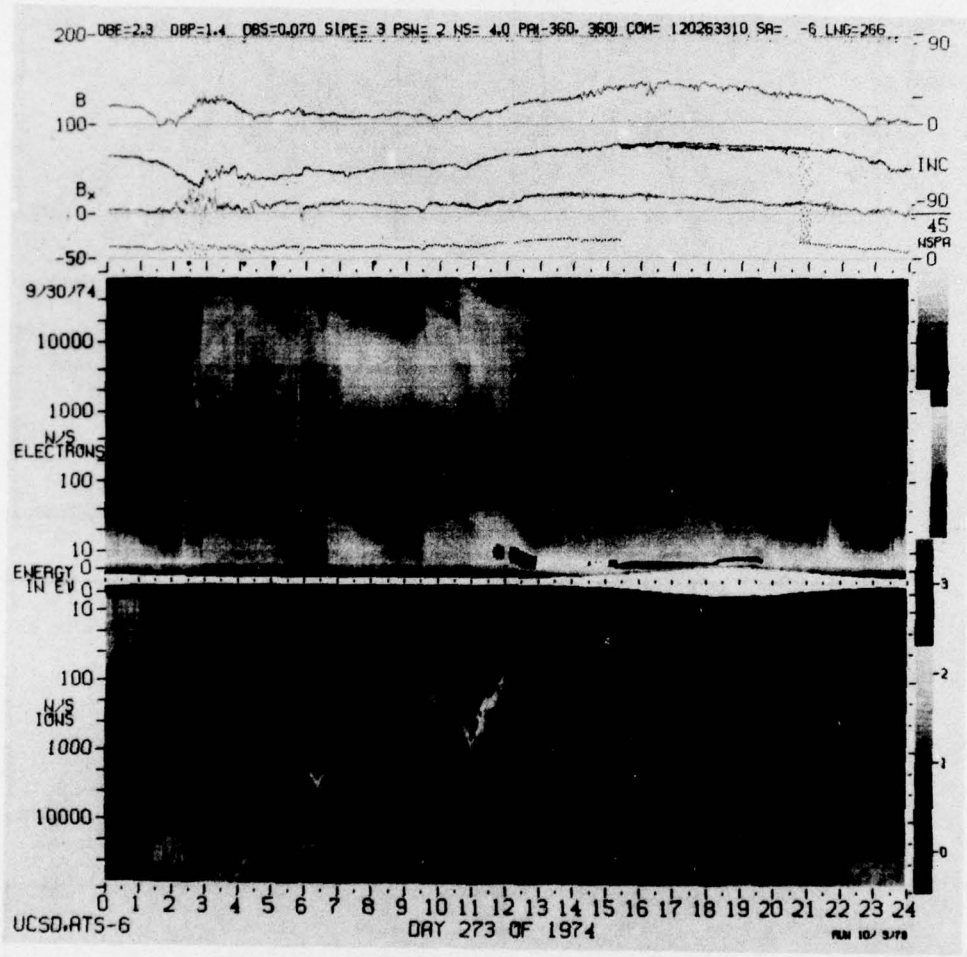
ATS-6 DATA
74/272



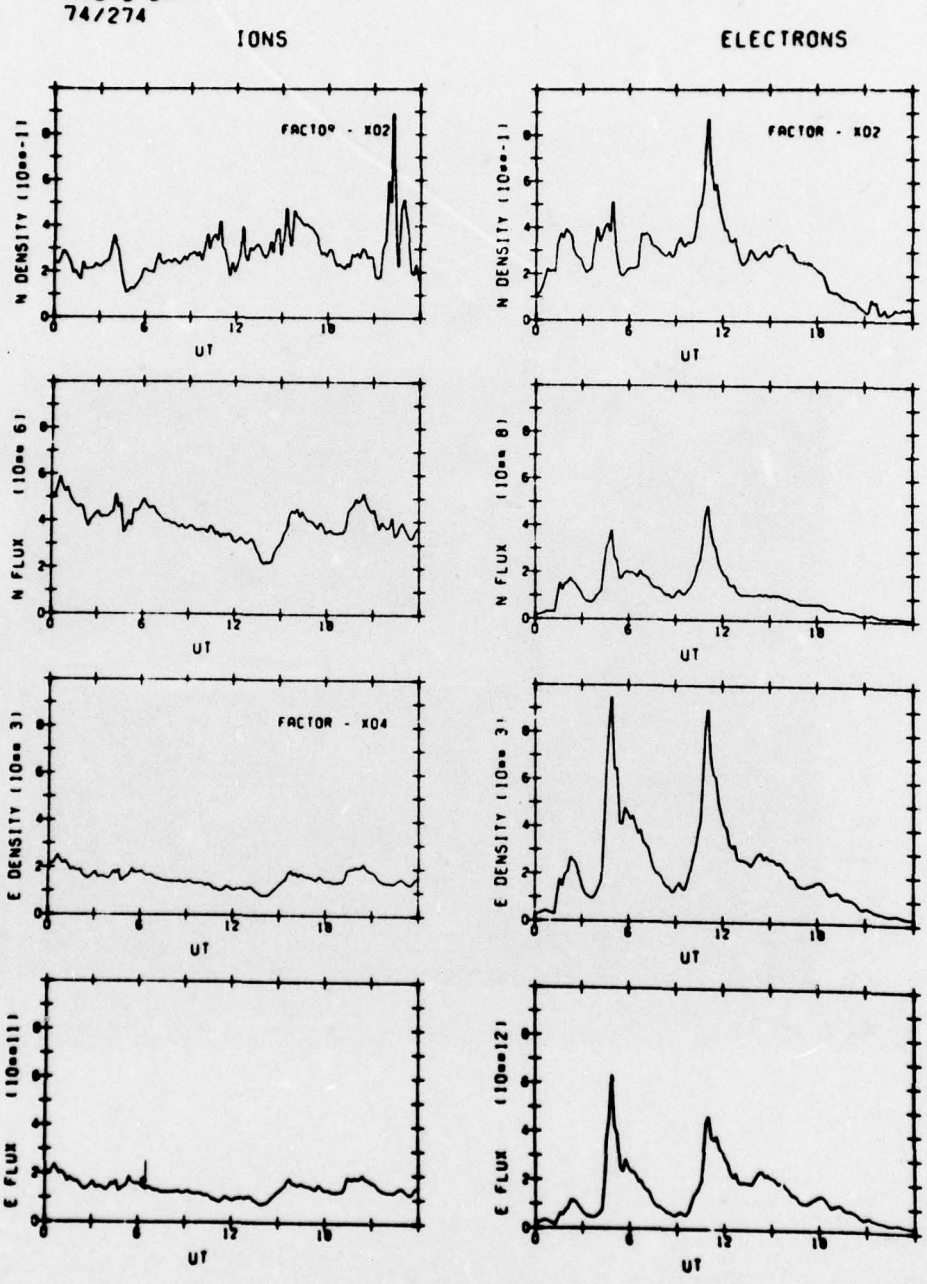

DBE=2.3 DBP=1.4 DBS=0.070 SIPE= 3 PSW= 2 NS= 4.0 PAI=360, 360 COM= 120263310 SA= -6 LNG=266
200
B
100
0
-50
Bx
INC
-90
45
NSPA
9/29/74
10000
1000
N/S ELECTRONS
100
10
ENERGY IN EV
0
10
100
N/S IONS
1000
10000
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24
UCSD,ATS-6
DAY 272 OF 1974

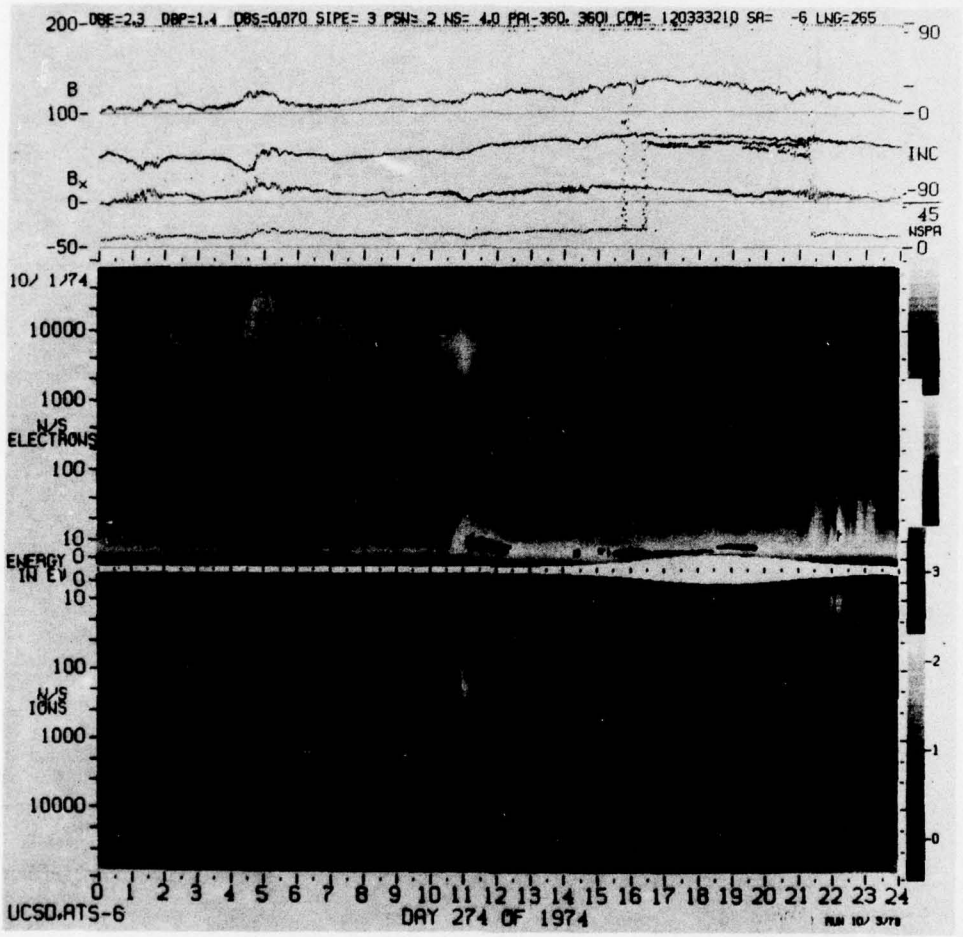
ATS-6 DATA
74/273

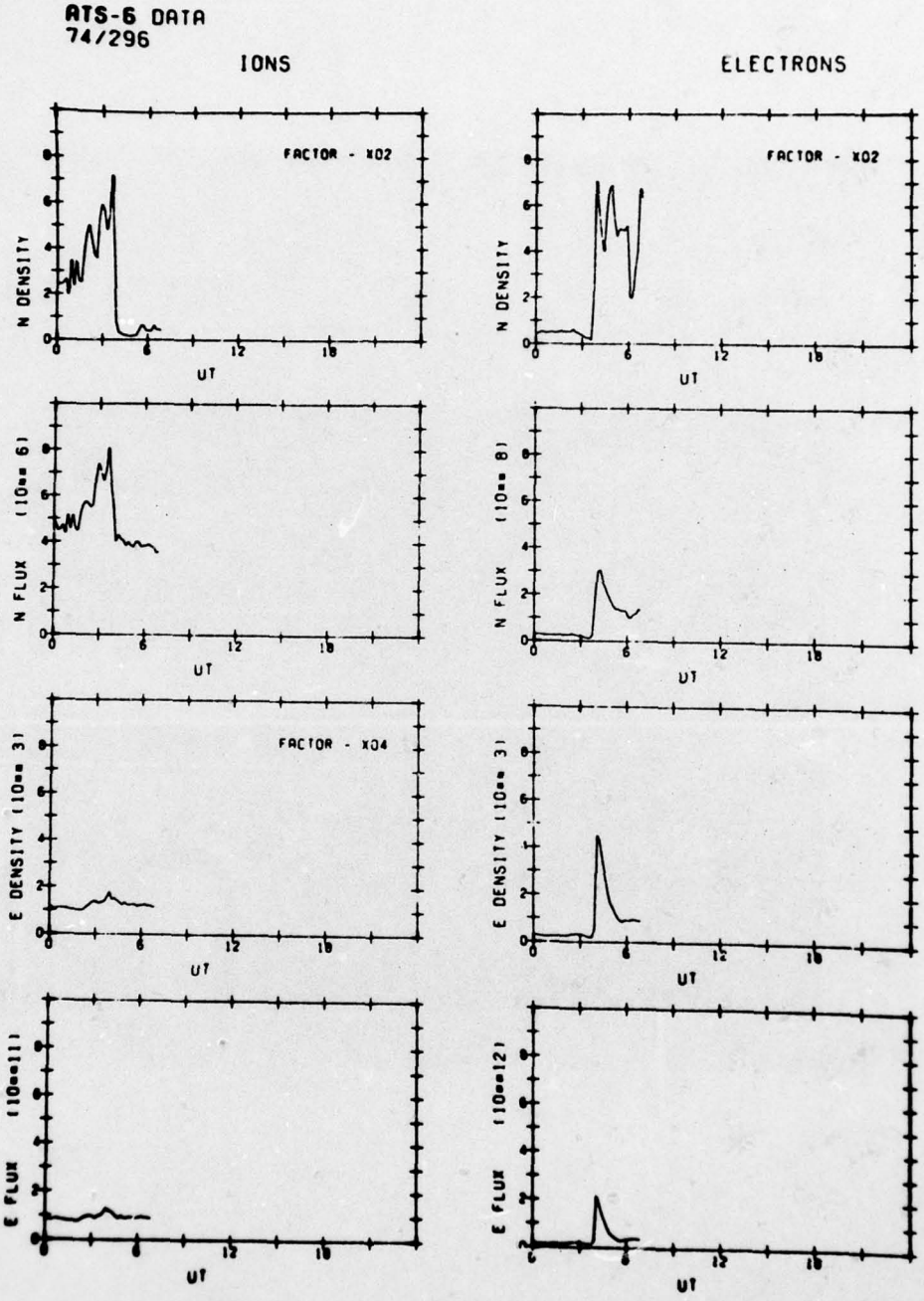


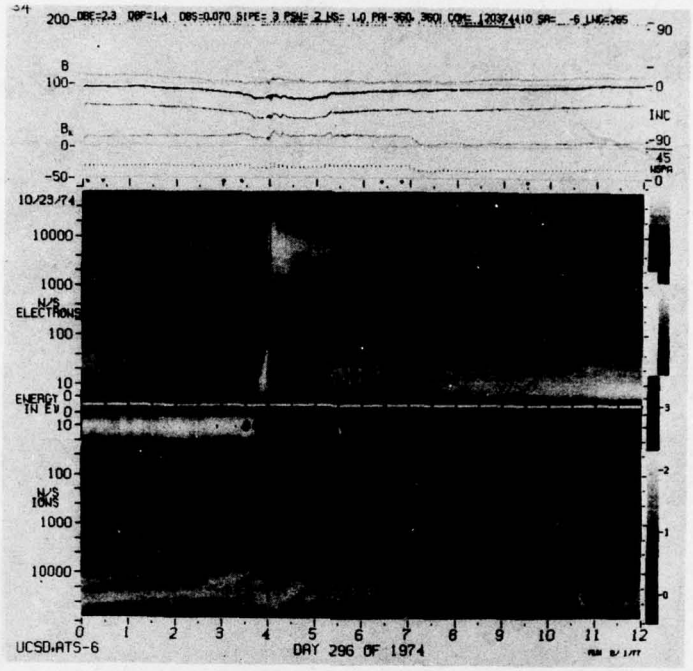

200-
DBE=2.3 DBP=1.4 DBS=0.070 SLPE= 3 PSW= 2 NS= 4.0 PAL=360. 360. COM= 120263310 SA= -6 LNG=266.
90
B
100-
0
INC
B_x
0-
-90
45
NSPA
-50-
0
9/30/74
10000
1000
N/S
ELECTRONS
100
10
ENERGY
IN EV
0
0
10
100
N/S
IONS
1000
10000
-3
-2
-1
-0
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24
UCSD.ATS-6
DAY 273 OF 1974
RUN 10/ 9/74

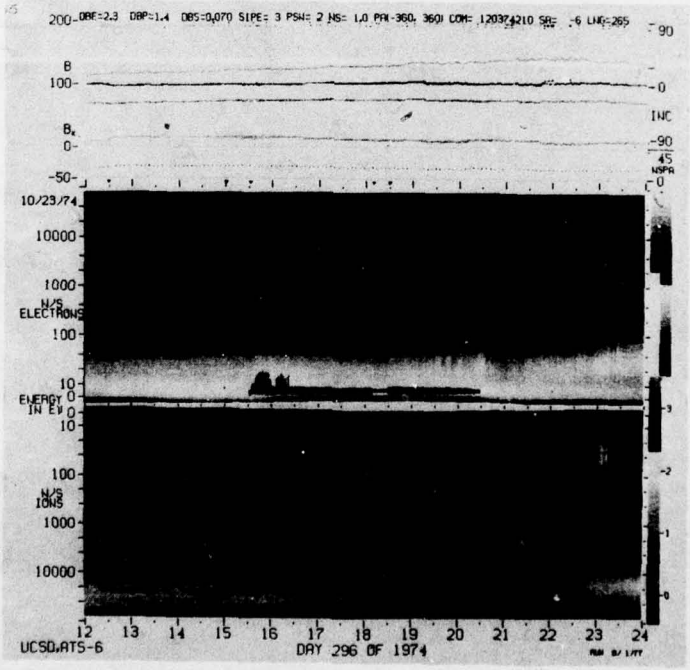
ATS-6 DATA
74/274



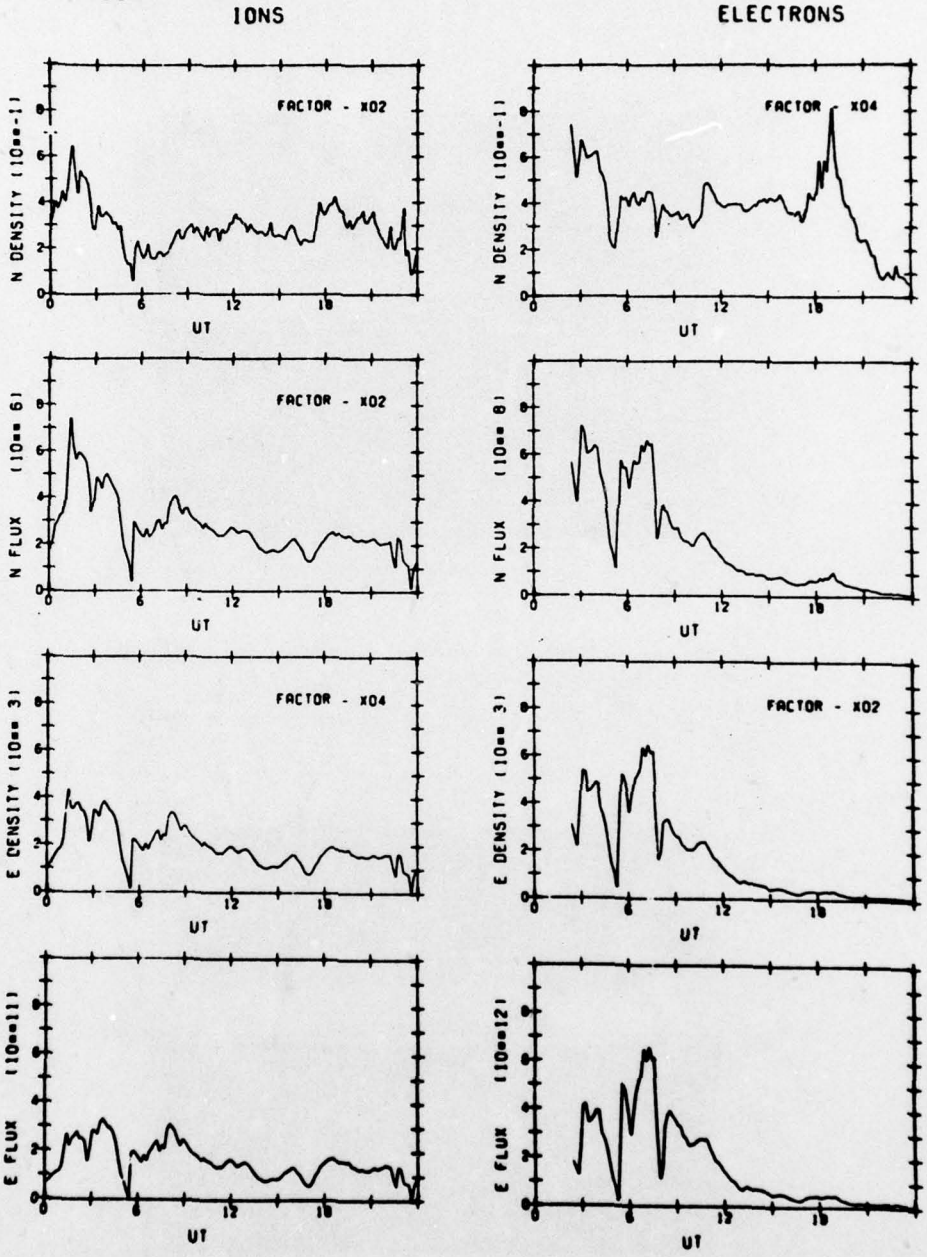

DBE=2.3 DBP=1.4 DBS=0.070 SIPE= 3 PSW= 2 NS= 4.0 PA(-360. 360) COM= 120333210 SA= -6 LNG=265
200
B
100
B_x
0
-50
90
0
INC
-90
45
NSPA
0
10/ 1/74
10000
1000
N/S
ELECTRONS
100
10
ENERGY
IN EV
0
0
10
100
N/S
IONS
1000
10000
3
2
1
0
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24
UCSD,ATS-6
DAY 274 OF 1974
RUN 10/ 3/78

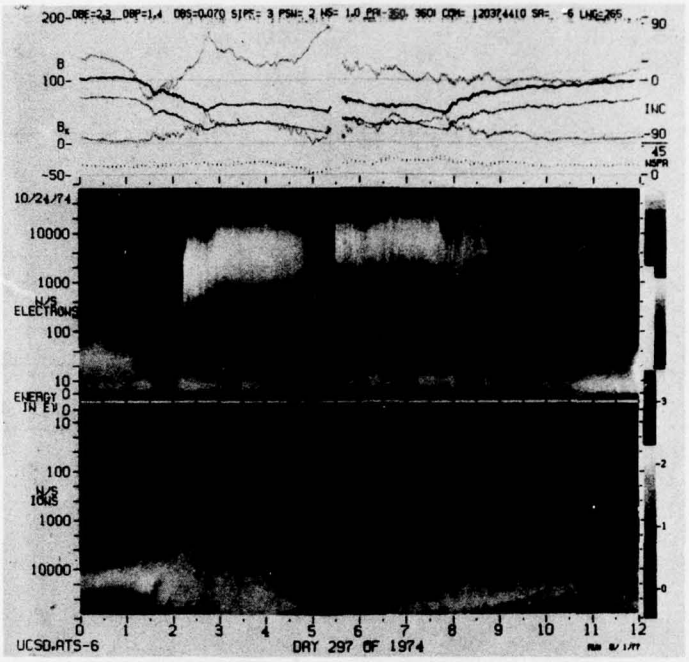

ATS-6 DATA
74/296
IONS
ELECTRONS
FACTOR - X02
N DENSITY
UT
N FLUX (10** 6)
N FLUX (10** 8)
FACTOR - X04
E DENSITY (10** 3)
E FLUX (10**11)
E FLUX (10**12)

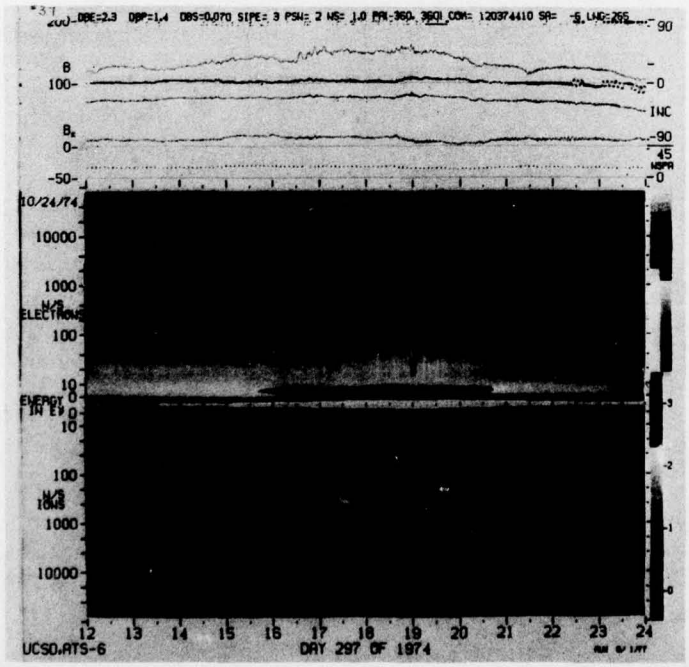

B
INC
10/23/74
N/S ELECTRONS
ENERGY IN EV
N/S IONS
UCSD,ATS-6
DAY 296 OF 1974

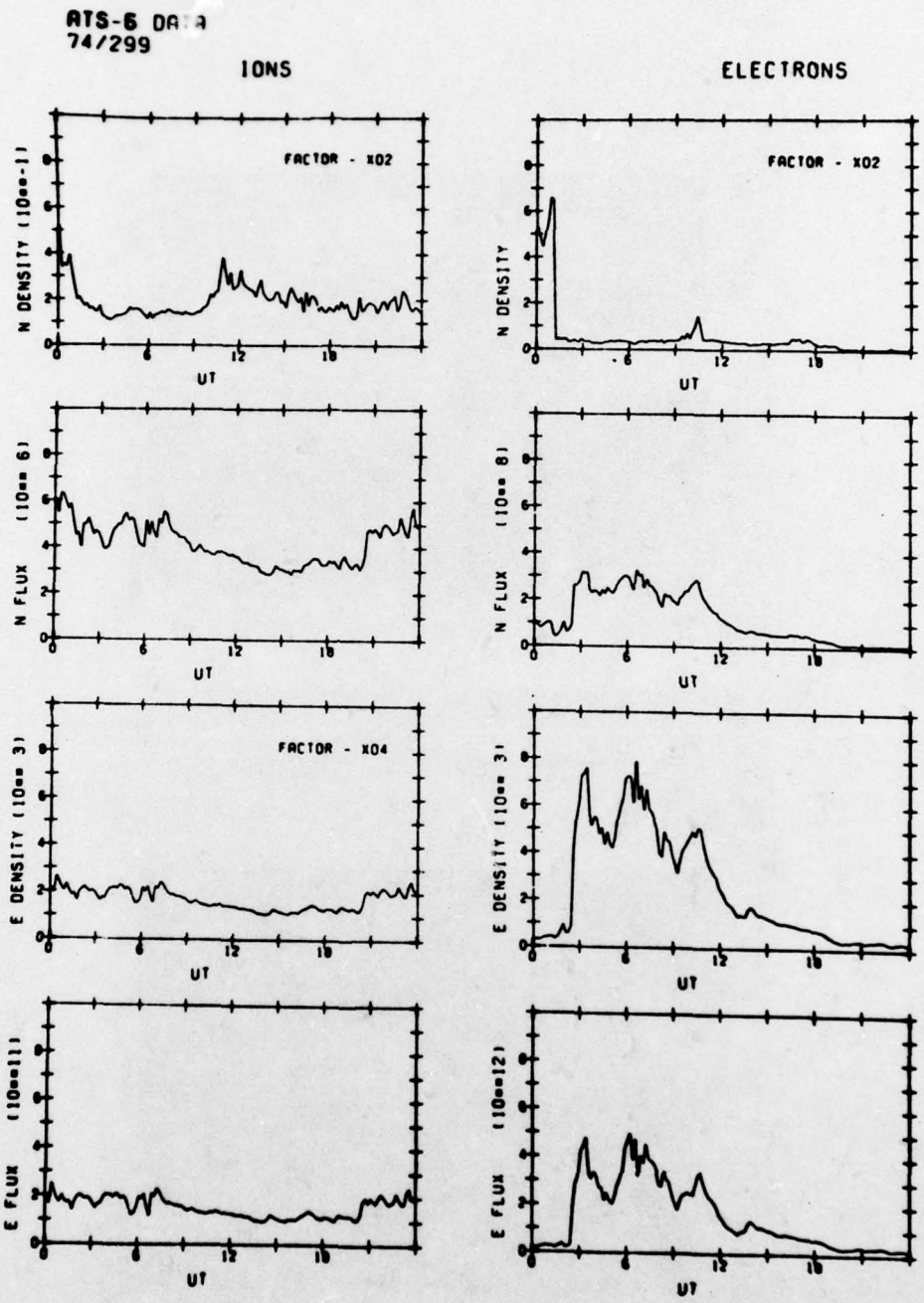

B
INC
10/23/74
N/S ELECTRONS
ENERGY IN EV
N/S IONS
UCSD,ATS-6
DAY 296 OF 1974

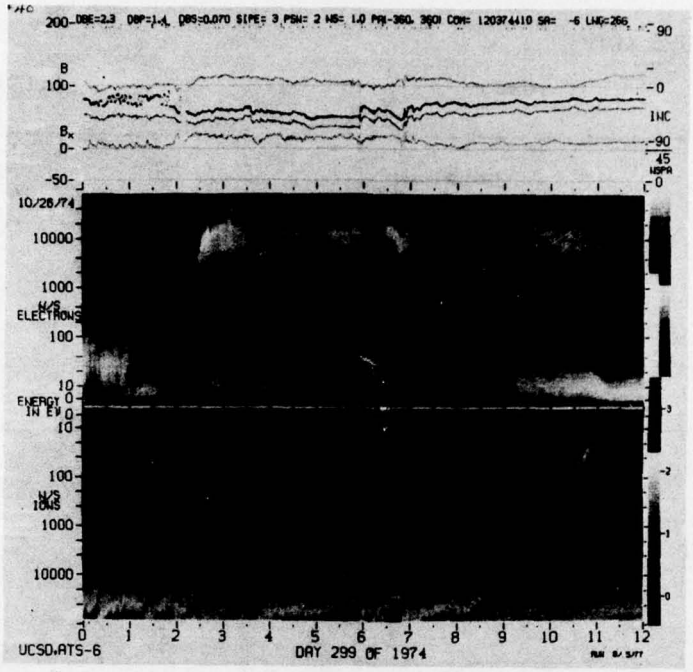
ATS-6 DATA
74/297

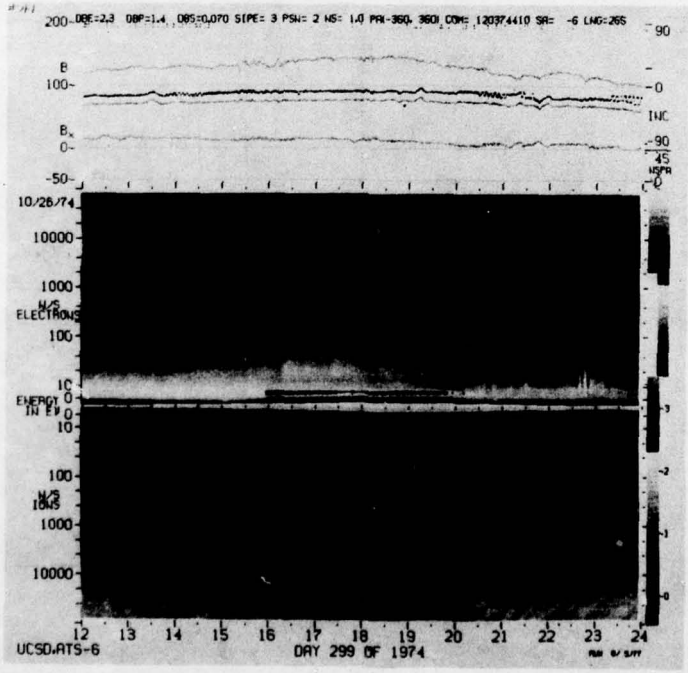



B
INC
10/24/74
ELECTRONS
IONS
UCSD,ATS-6
DAY 297 OF 1974


B
INC
10/24/74
ELECTRONS
IONS
UCSD,ATS-6
DAY 297 OF 1974


ATS-6 DATA
74/299
IONS
ELECTRONS
FACTOR - X02
N DENSITY (10**-1)
N DENSITY
FACTOR - X02
N FLUX (10** 6)
N FLUX (10** 8)
FACTOR - X04
E DENSITY (10** 3)
E DENSITY (10** 3)
E FLUX (10**11)
E FLUX (10**12)
UT


200-DBE=2.3 DBP=1.4 DBS=0.070 SIPE= 3 PSN= 2 NS= 1.0 PAR-360. 360I COM: 120374410 SA= -6 LNG=266
B
100-
Bx
0-
-50-
INC
MSPA
10/28/74
10000
1000
N/S
ELECTRONS
100
10
ENERGY
IN EV
0
10
100
N/S
IONS
1000
10000
0 1 2 3 4 5 6 7 8 9 10 11 12
UCSD,ATS-6
DAY 299 OF 1974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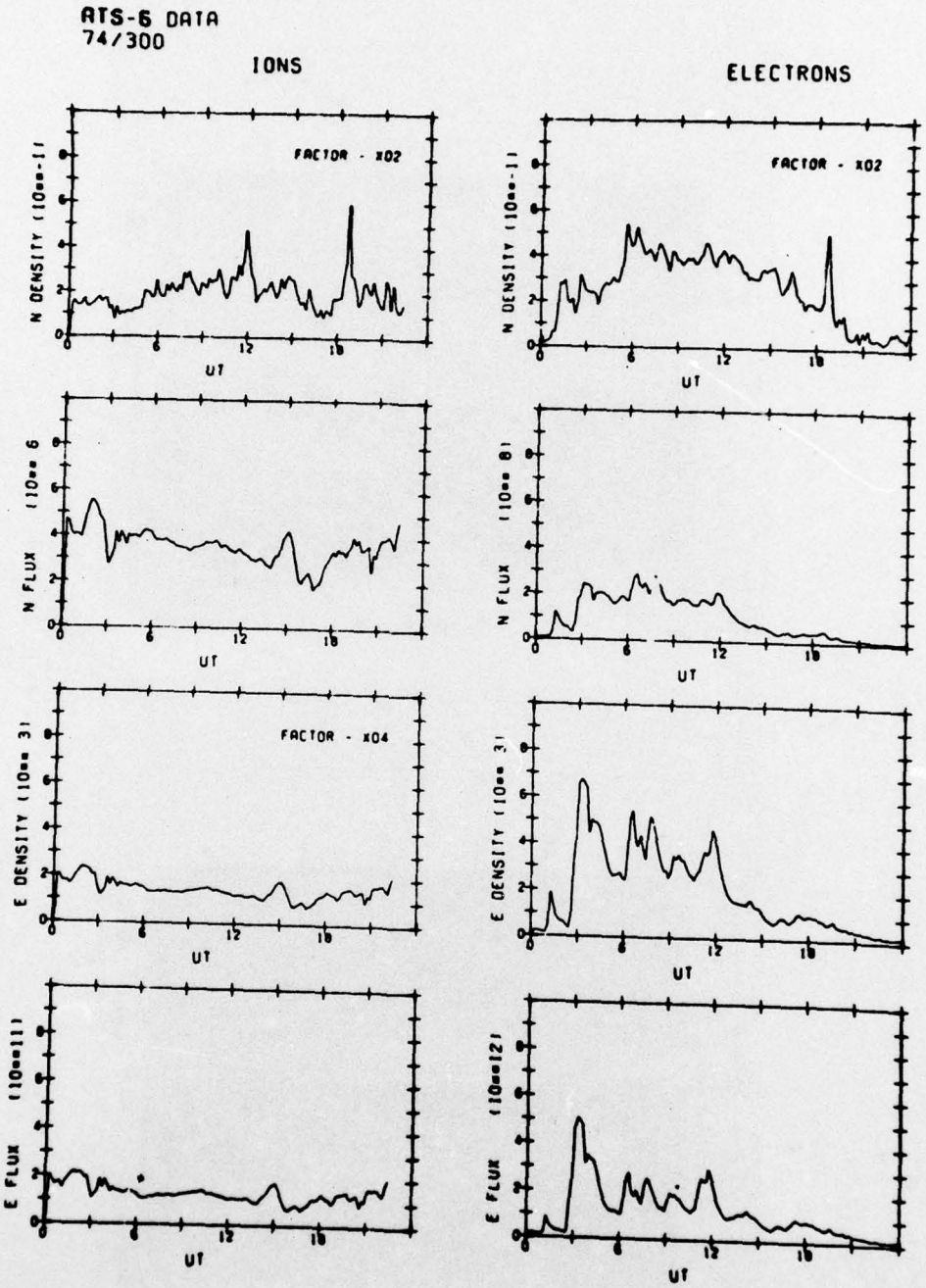
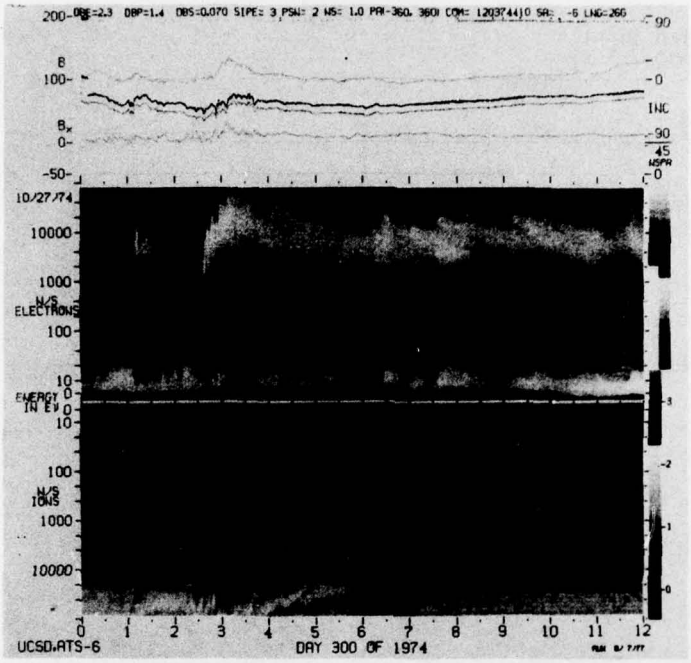
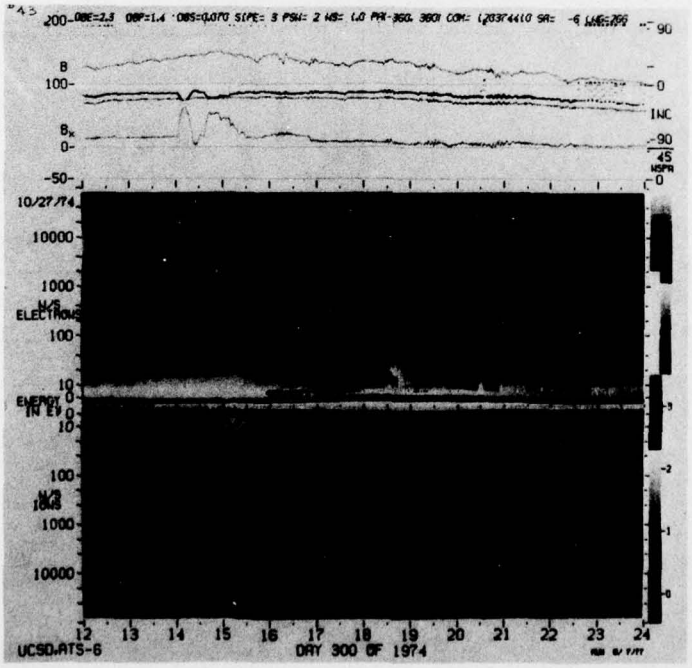
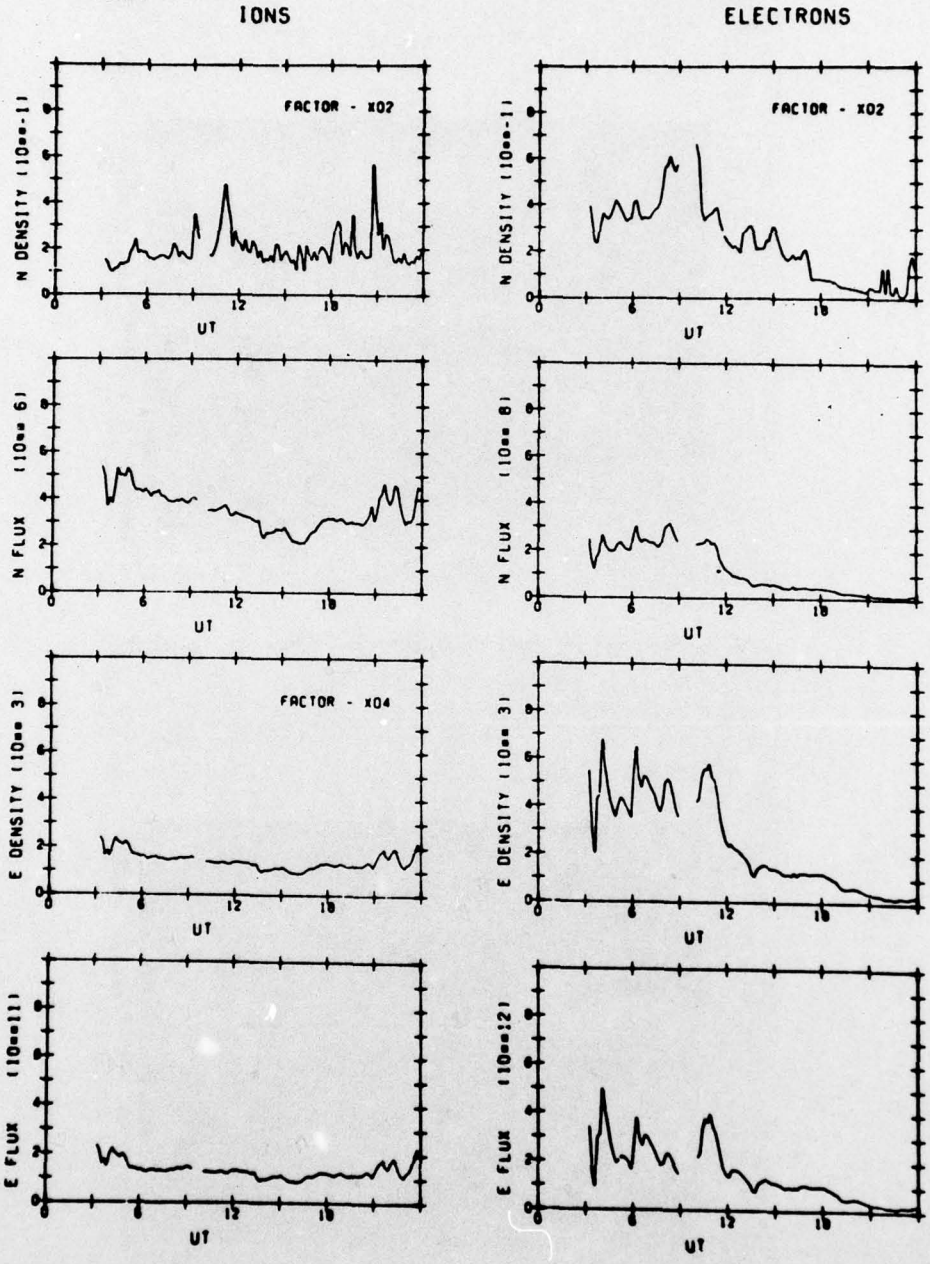
B
100-
Bx
0-
-50-
INC
MSPA
10/28/74
10000
1000
N/S
ELECTRONS
100
10
ENERGY
IN EV
0
10
100
N/S
IONS
1000
10000
12 13 14 15 16 17 18 19 20 21 22 23 24
UCSD,ATS-6
DAY 299 OF 1974

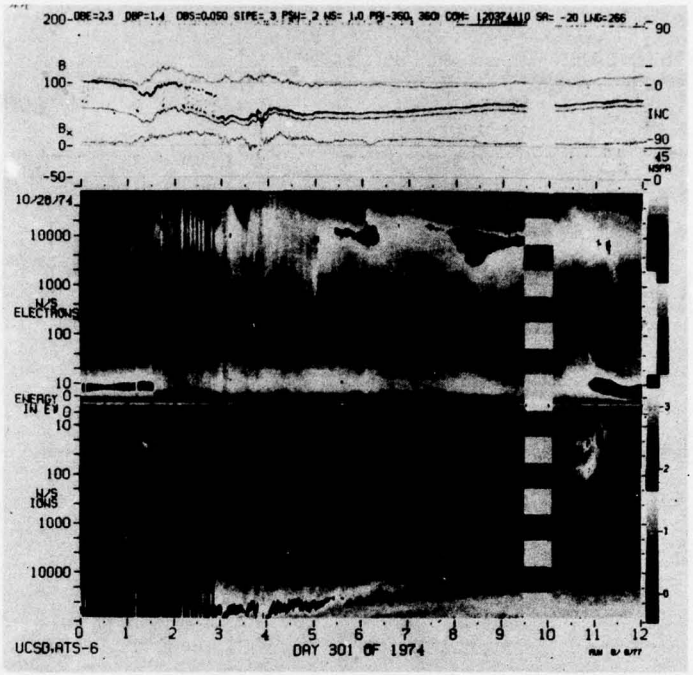

ATS-6 DATA
74/300
IONS
ELECTRONS
FACTOR - X02
N DENSITY (10**-1)
FACTOR - X02
N DENSITY (10**-1)
N FLUX (10** 6)
N FLUX (10** 8)
FACTOR - X04
E DENSITY (10** 3)
E DENSITY (10** 3)
E FLUX (10**11)
E FLUX (10**12)
UT
0
6
12
18

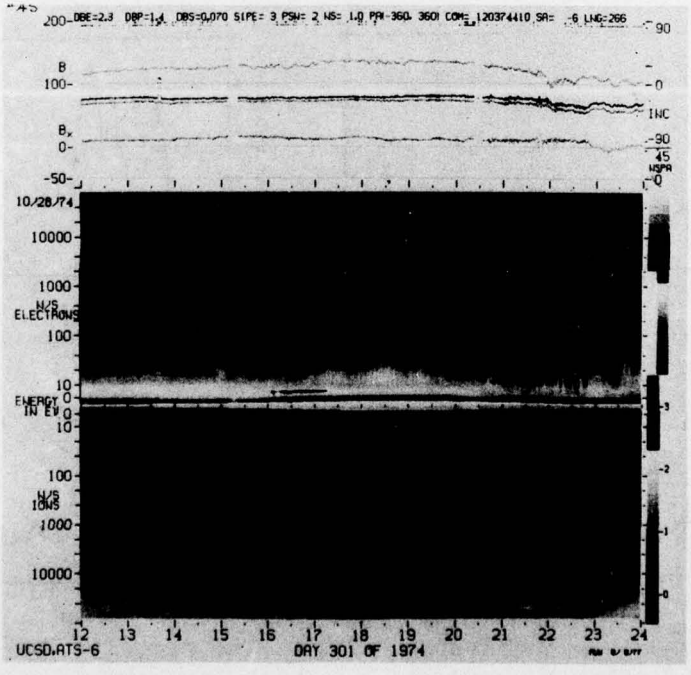

B
Bx
INC
10/27/74
ELECTRONS
IONS
UCSD-ATS-6
DAY 300 OF 1974

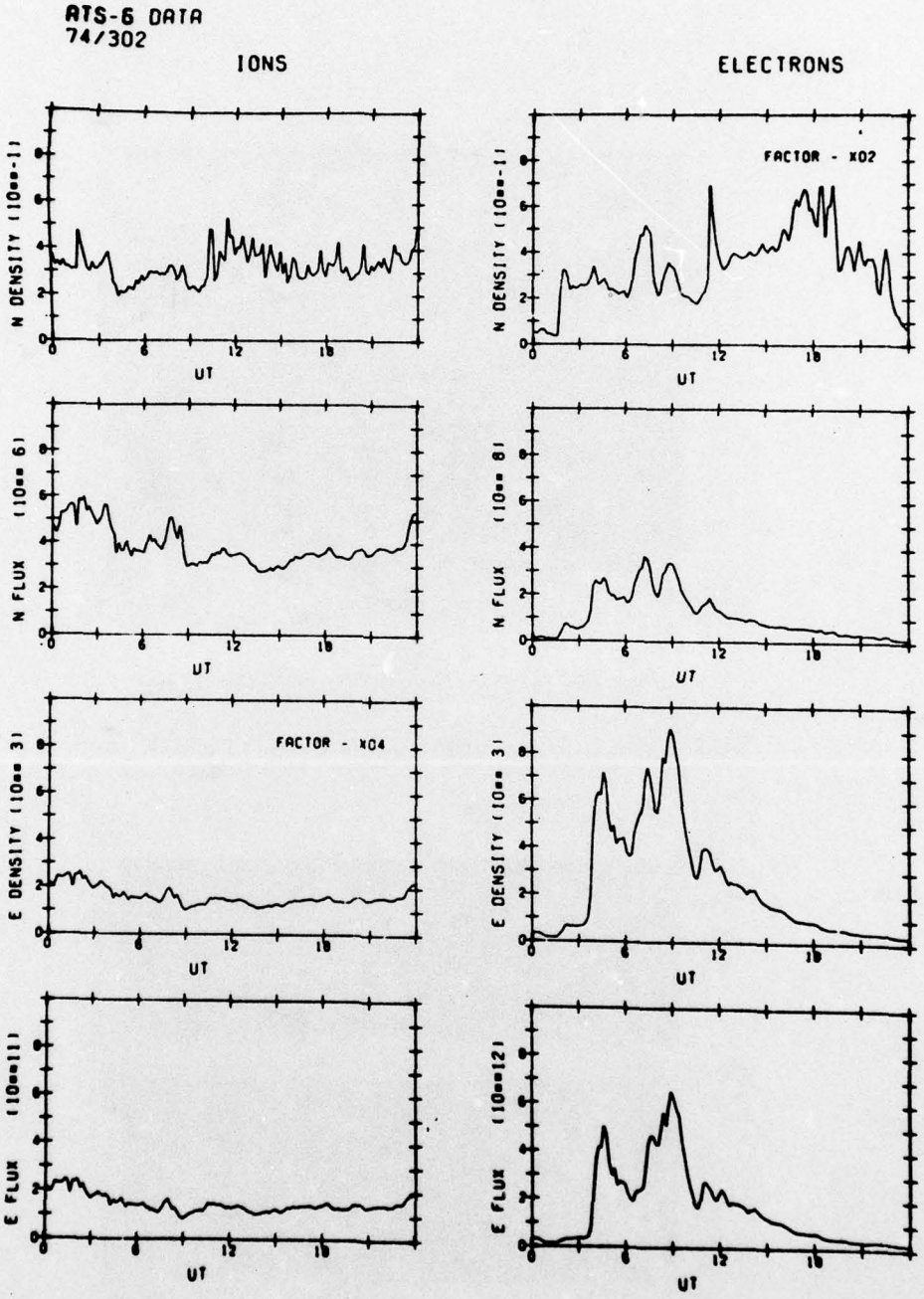

B
Bx
INC
10/27/74
ELECTRONS
IONS
UCSD-ATS-6
DAY 300 OF 1974

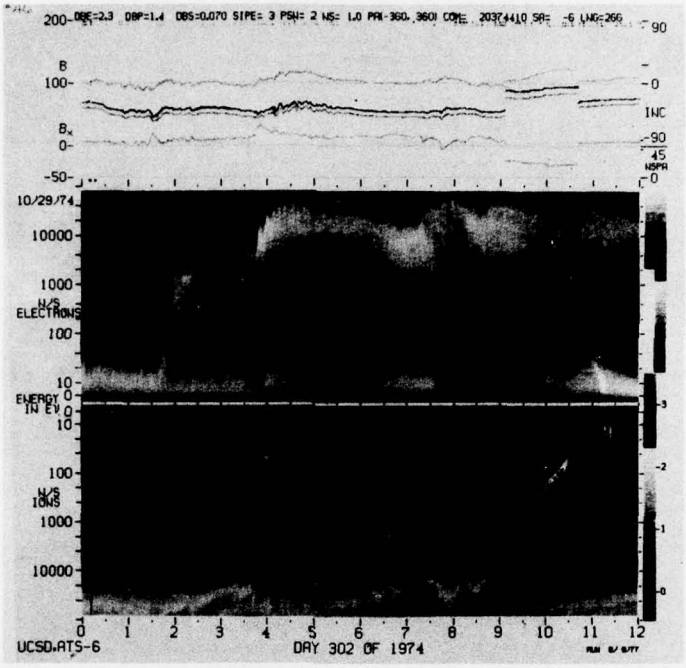
ATS-6 DATA
74/301

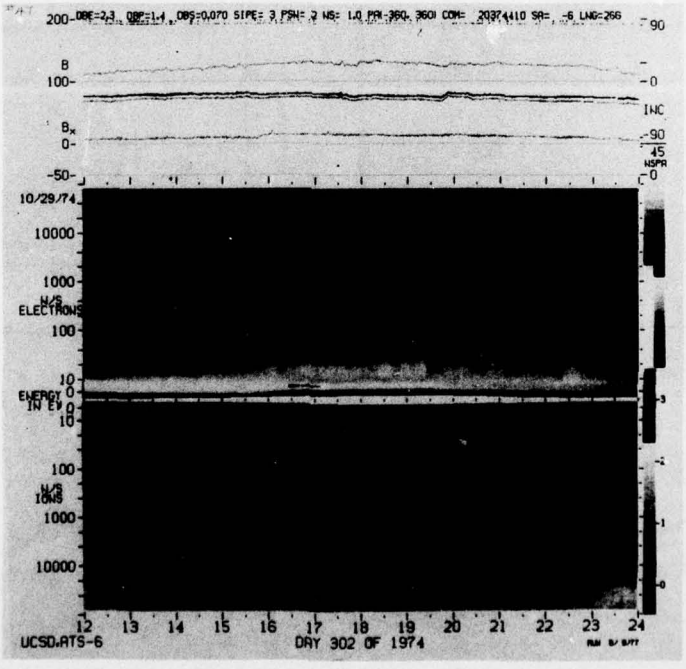



B
100
0
-50
B_x
INC
90
0
-90
45
0
10/28/74
10000
1000
M/S
ELECTRONS
100
10
ENERGY
IN EV
0
10
100
M/S
IONS
1000
10000
0 1 2 3 4 5 6 7 8 9 10 11 12
UCSD,ATS-6
DAY 301 OF 1974

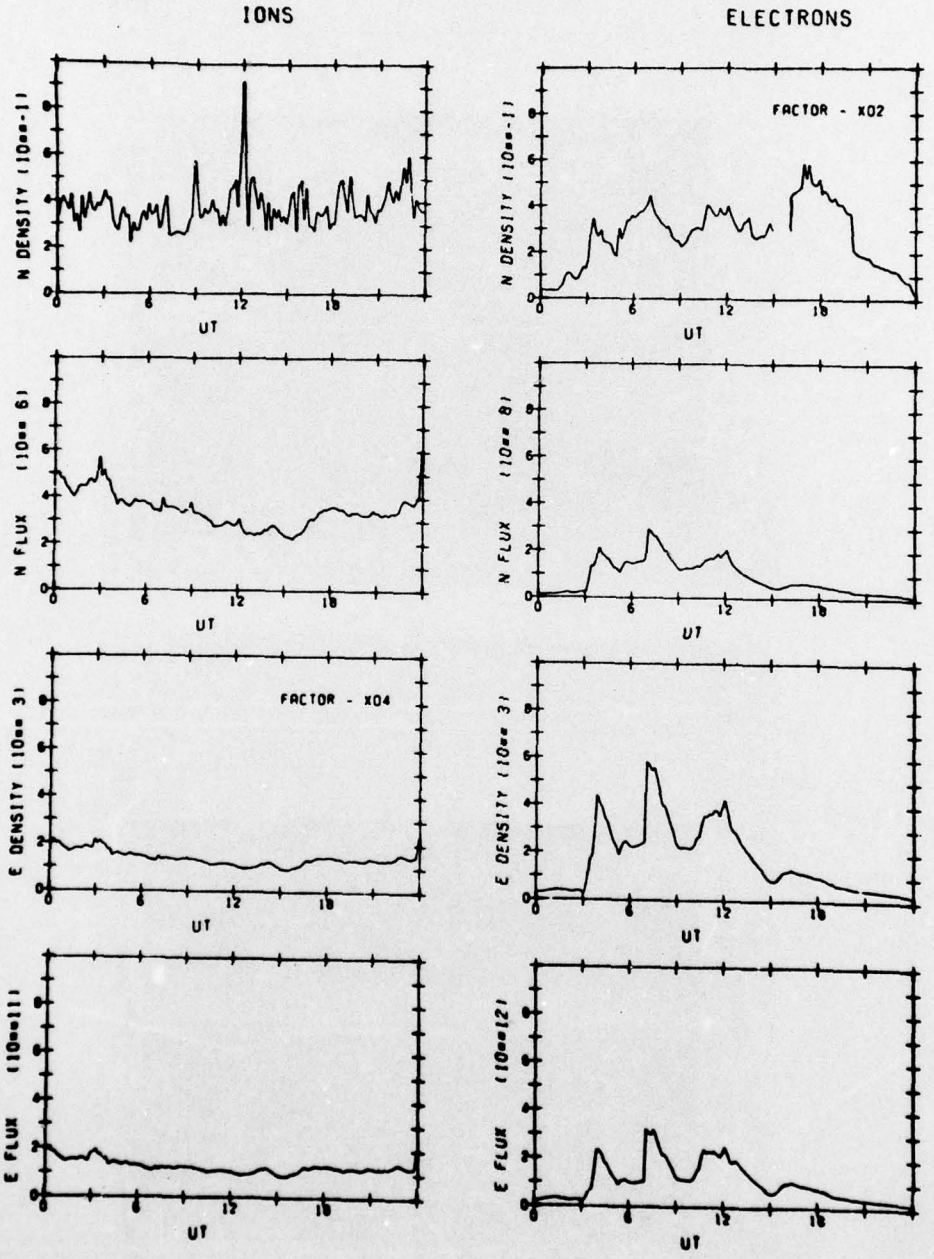

B
100
0
-50
B_x
INC
90
0
-90
45
0
10/28/74
10000
1000
M/S
ELECTRONS
100
10
ENERGY
IN EV
0
10
100
M/S
IONS
1000
10000
12 13 14 15 16 17 18 19 20 21 22 23 24
UCSD,ATS-6
DAY 301 OF 1974

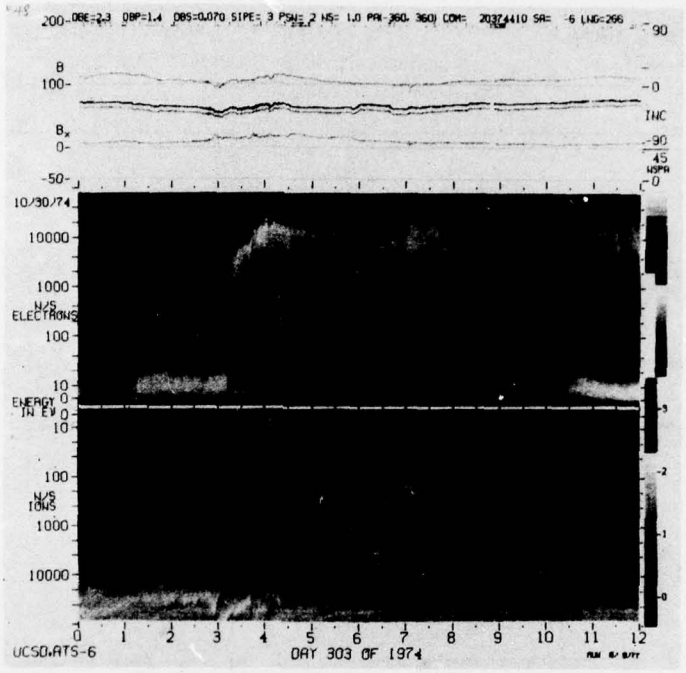

ATS-6 DATA
74/302
IONS
ELECTRONS
N DENSITY (10**-1)
FACTOR - X02
N FLUX (10** 6)
N FLUX (10** 8)
E DENSITY (10** 3)
FACTOR - X04
E DENSITY (10** 3)
E FLUX (10**11)
E FLUX (10**12)
UT
0
6
12
18

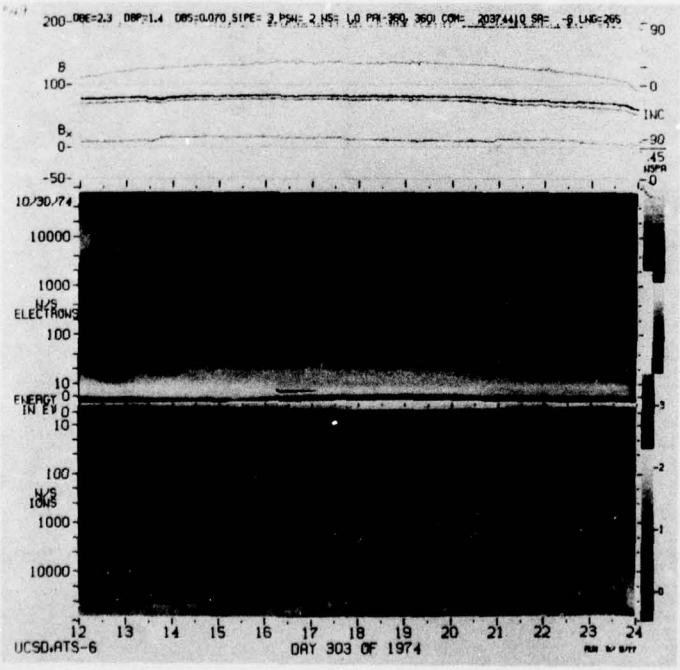

B
100-
B_x
0-
-50-
10/29/74
10000
1000
H/S
ELECTRONS
100
10
ENERGY
IN EV
0
10
100
H/S
IONS
1000
10000
90
0
INC
-90
45
NSPR
0
-3
-2
-1
-0
0 1 2 3 4 5 6 7 8 9 10 11 12
UCSD.ATS-6
DAY 302 OF 1974


B
100-
B_x
0-
-50-
10/29/74
10000
1000
H/S
ELECTRONS
100
10
ENERGY
IN EV
0
10
100
H/S
IONS
1000
10000
90
0
INC
-90
45
NSPR
0
-3
-2
-1
-0
12 13 14 15 16 17 18 19 20 21 22 23 24
UCSD.ATS-6
DAY 302 OF 1974

ATS-6 DATA
74/303

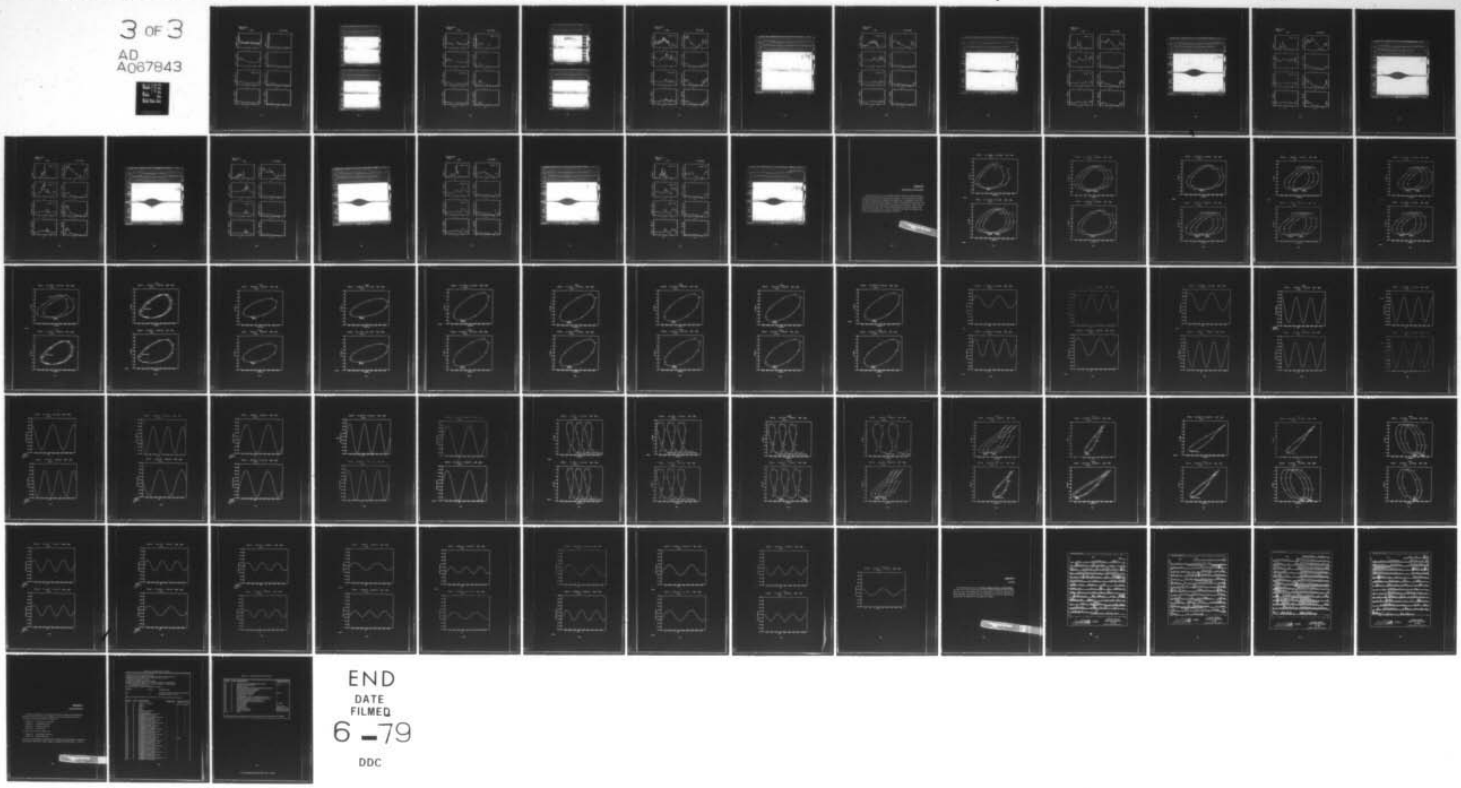



B
100-
B_x
0-
-50-
INC
-90
45
WSPR
-0
10/30/74
10000
1000
H/S
ELECTRONS
100
10
ENERGY
IN EV
0
10
100
H/S
IONS
1000
10000
0 1 2 3 4 5 6 7 8 9 10 11 12
UCSD,ATS-6
DAY 303 OF 1974

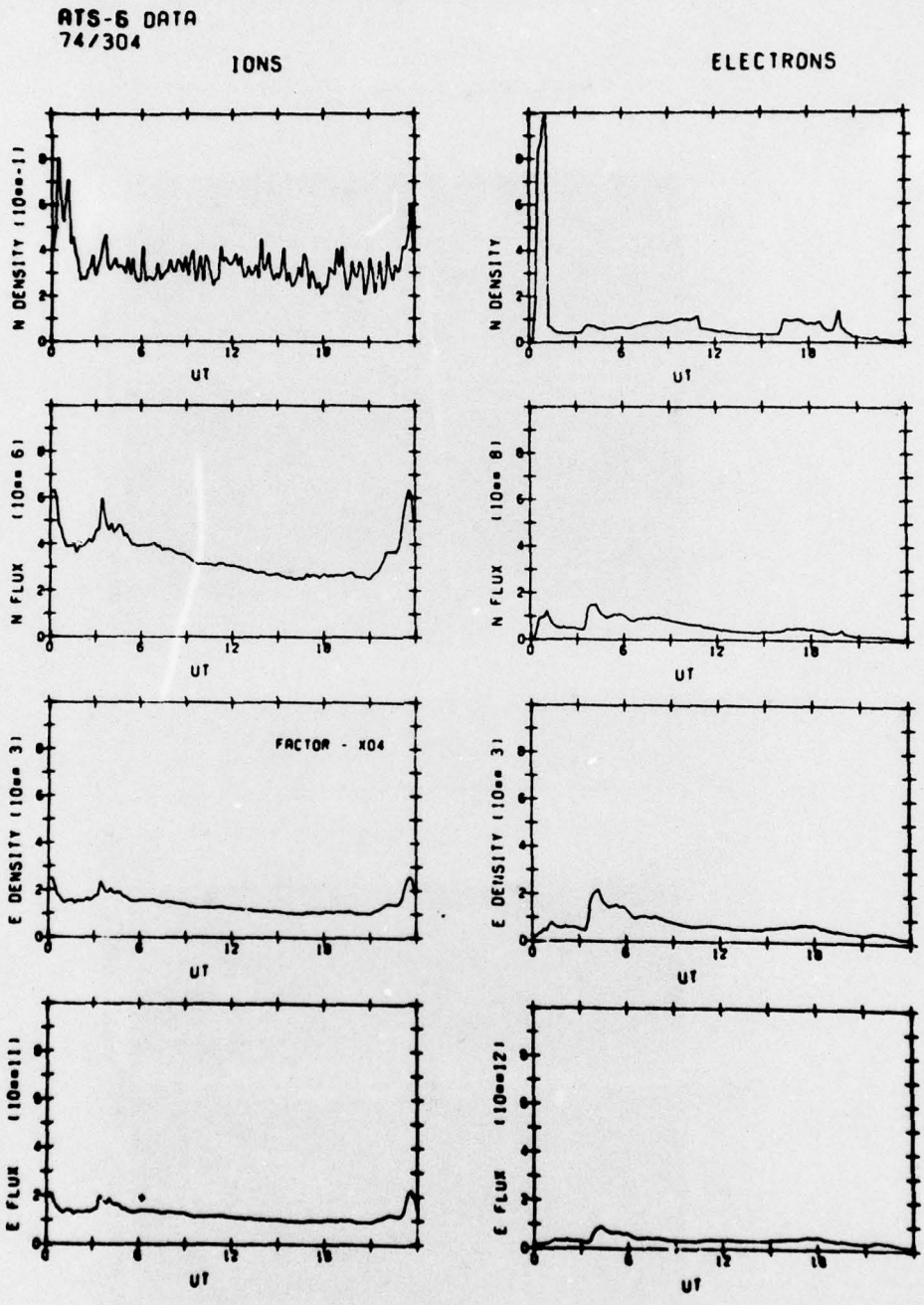

B
100-
B_x
0-
-50-
INC
-90
45
WSPR
-0
10/30/74
10000
1000
H/S
ELECTRONS
100
10
ENERGY
IN EV
0
10
100
H/S
IONS
1000
10000
12 13 14 15 16 17 18 19 20 21 22 23 24
UCSD,ATS-6
DAY 303 OF 1974

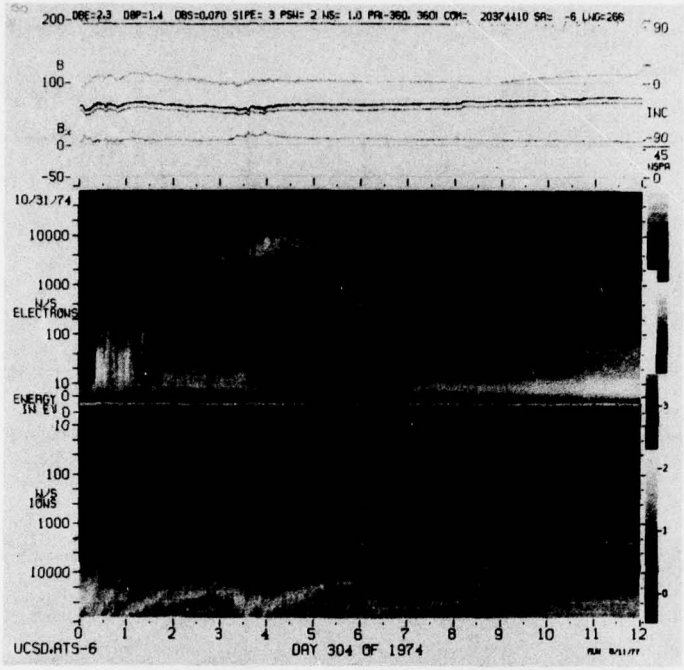
AD-A067 843 AIR FORCE GEOPHYSICS LAB HANSCOM AFB MASS F/G 4/1
MODELING OF THE GEOSYNCHRONOUS ORBIT PLASMA ENVIRONMENT. PART 3--ETC(U)
JAN 79 H B GARRETT, R E MCINERNEY
UNCLASSIFIED AFGL-TR-79-0015 NL

3 OF 3
AD
A067843



END
DATE
FILMED
6-79
DDC


ATS-6 DATA
74/304
IONS
ELECTRONS
N DENSITY (10**-1)
N DENSITY
N FLUX (10** 6)
N FLUX (10** 8)
E DENSITY (10** 3)
FACTOR - X04
E DENSITY (10** 3)
E FLUX (10**11)
E FLUX (10**12)
UT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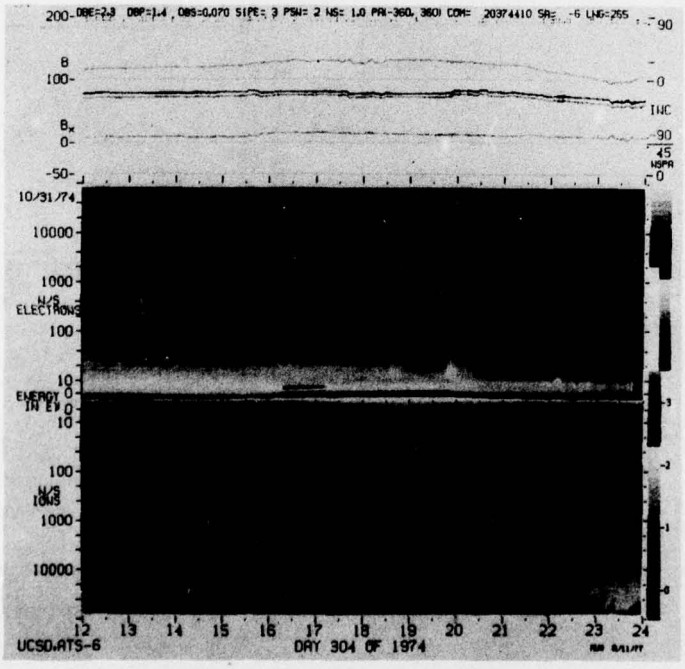
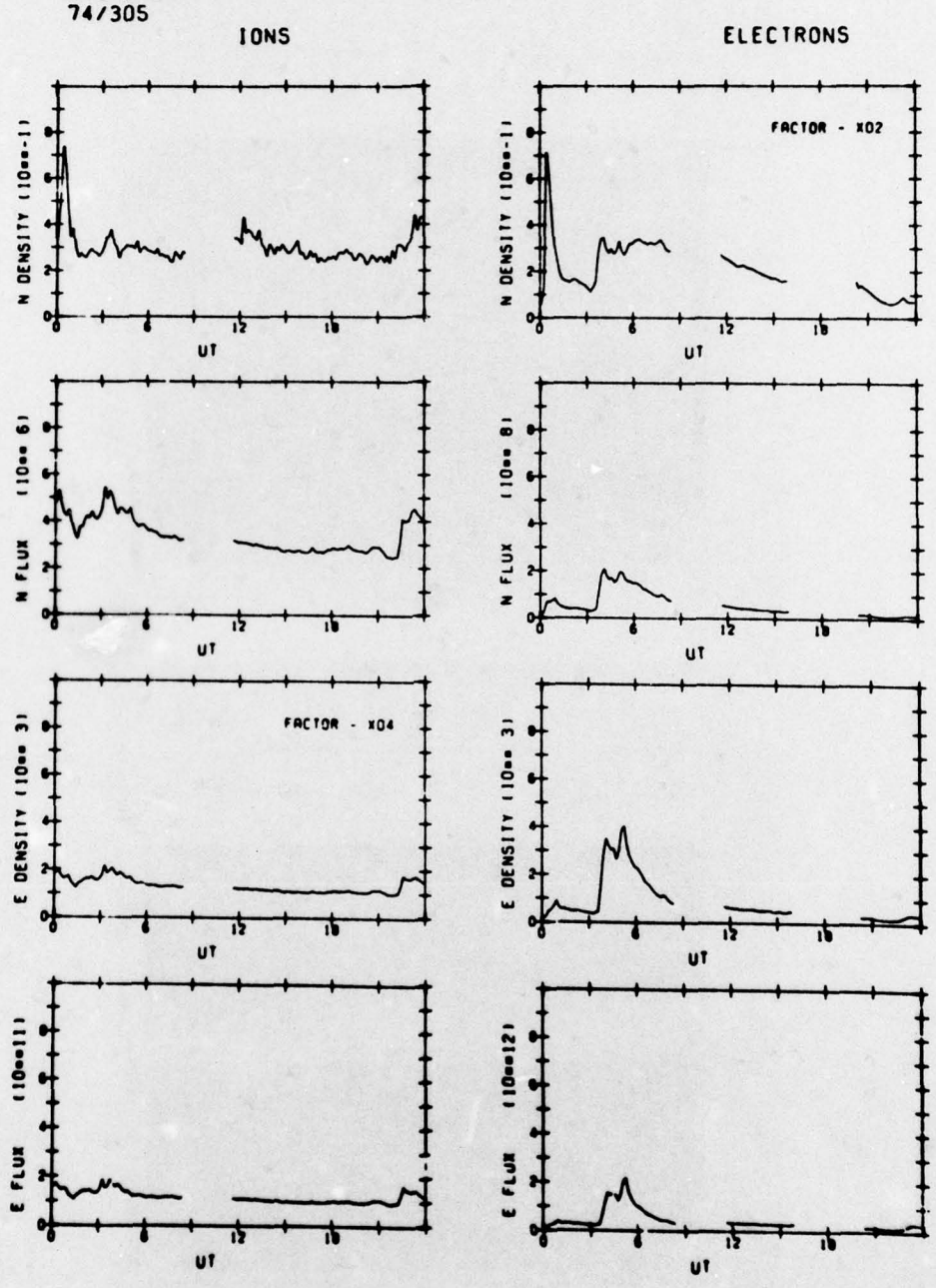
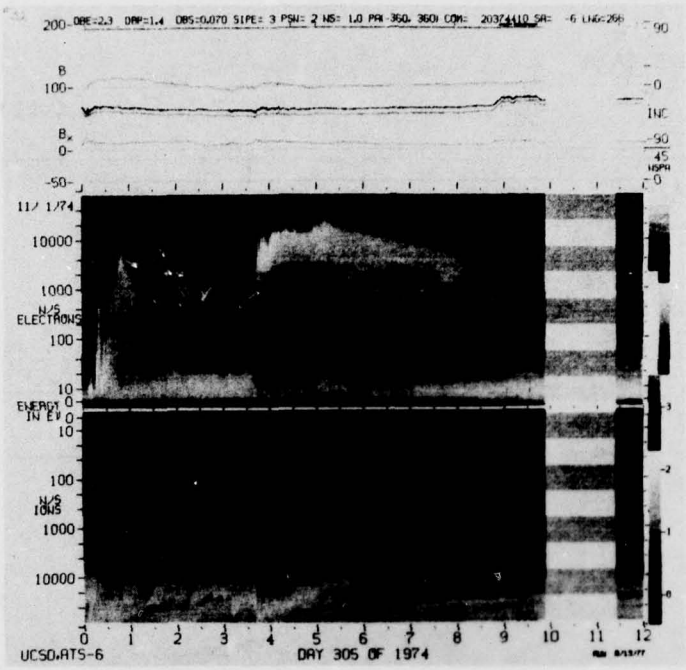
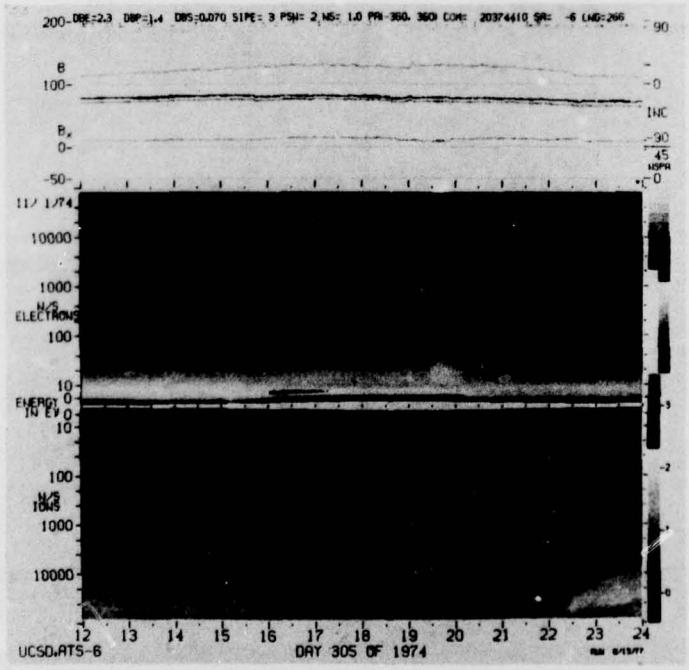
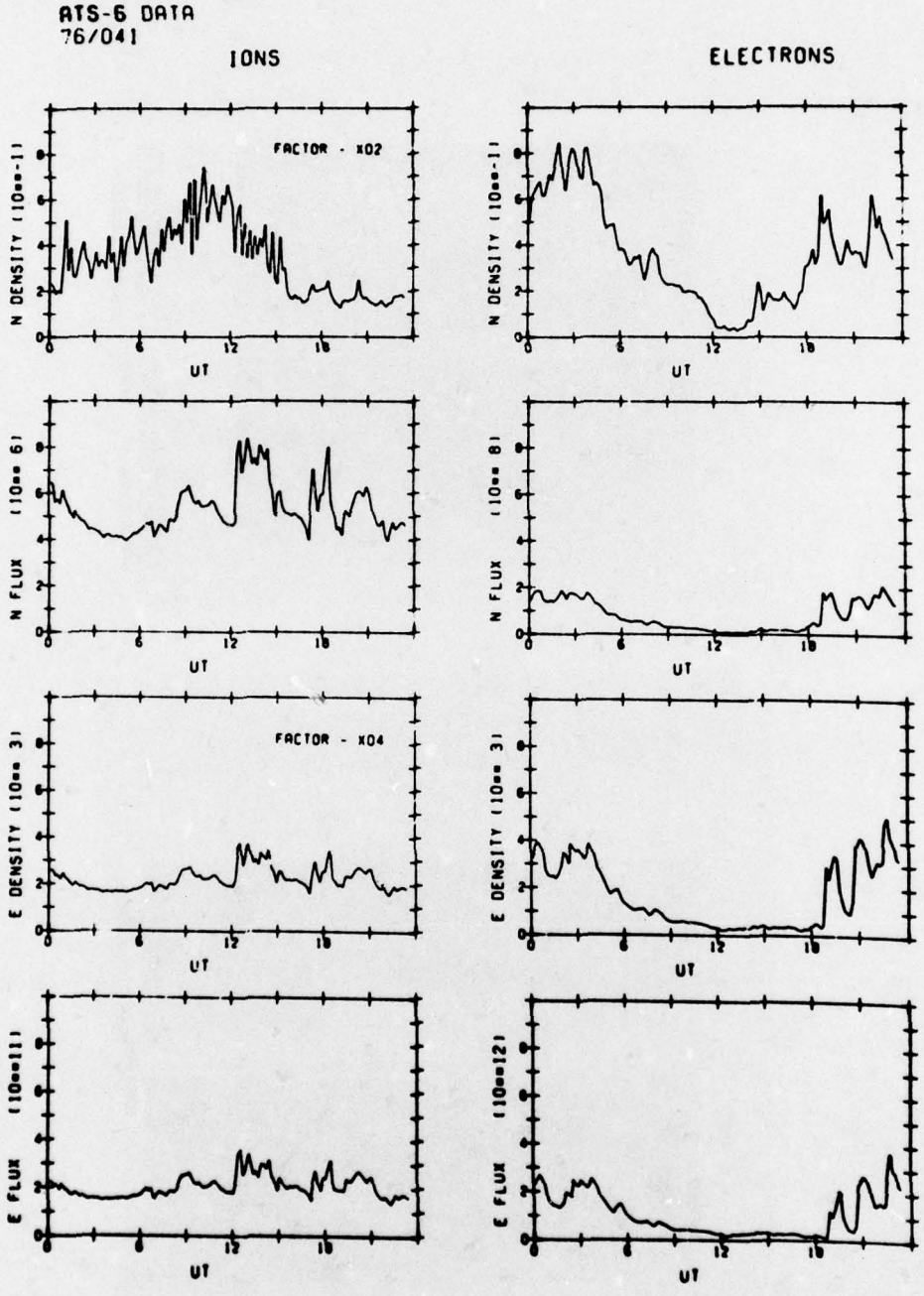
B
Bx
INC
NSPA
10/31/74
ELECTRONS
IONS
ENERGY IN EV
UCSD,ATS-6
DAY 304 OF 1974

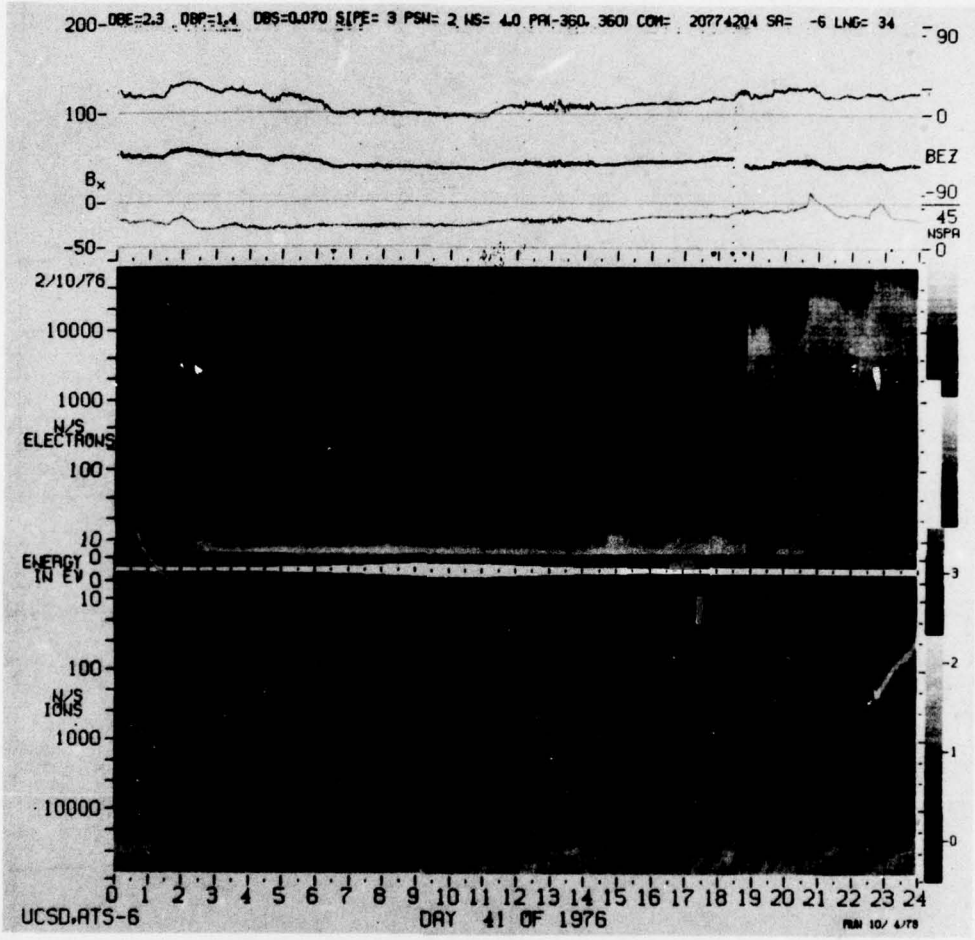

DBE=2.3 DBP=1.4 OBS=0.070 SIPE= 3 PSW= 2 NS= 1.0 PR=-360, 360 COM= 20374410 SA= -6 LNG=265
B
Bx
INC
NSPA
10/31/74
ELECTRONS
IONS
ENERGY IN EV
UCSD,ATS-6
DAY 304 OF 1974


ATS-6 DATA
74/305
IONS
ELECTRONS
N DENSITY (10**-1)
FACTOR - X02
N FLUX (10** 6)
N FLUX (10** 8)
E DENSITY (10** 3)
FACTOR - X04
E DENSITY (10** 3)
E FLUX (10**11)
E FLUX (10**12)
UT


B
INC
HSPR
11/ 1/74
10000
1000
N/S
ELECTRONS
100
10
ENERGY
IN EV
IONS
UCSD,ATS-6
DAY 305 OF 1974


B
INC
HSPR
11/ 1/74
10000
1000
N/S
ELECTRONS
100
10
ENERGY
IN EV
IONS
UCSD,ATS-6
DAY 305 OF 1974


ATS-6 DATA
76/041
IONS
ELECTRONS
FACTOR - X02
N DENSITY (10**-1)
N FLUX (10** 6)
N FLUX (10** 8)
FACTOR - X04
E DENSITY (10** 3)
E FLUX (10**11)
E FLUX (10**12)
UT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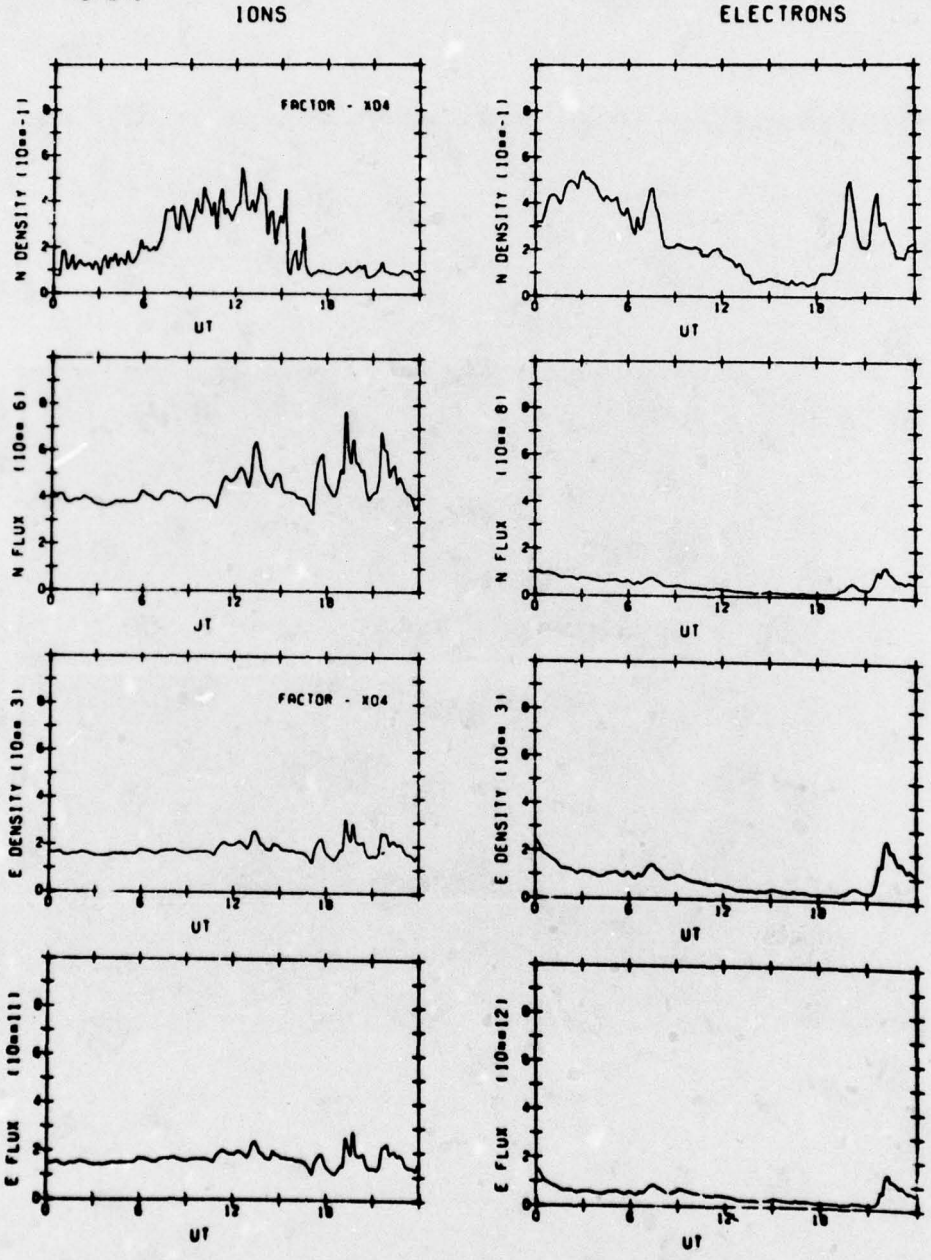
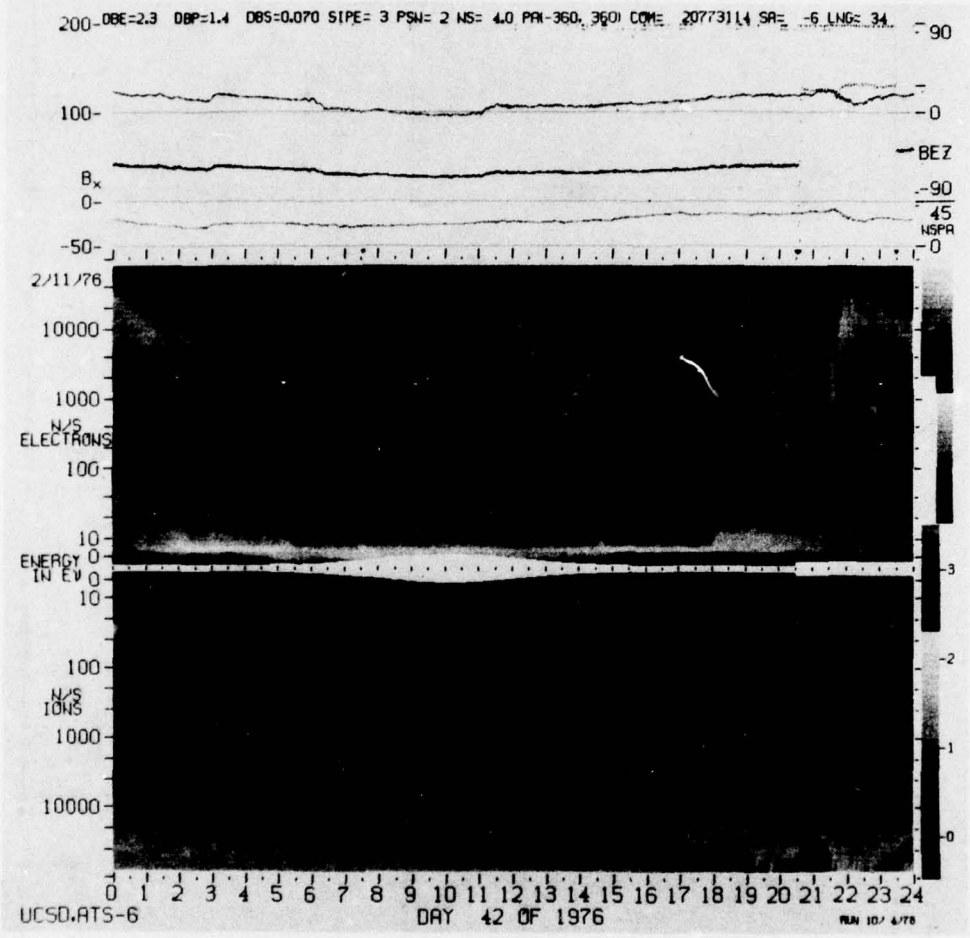
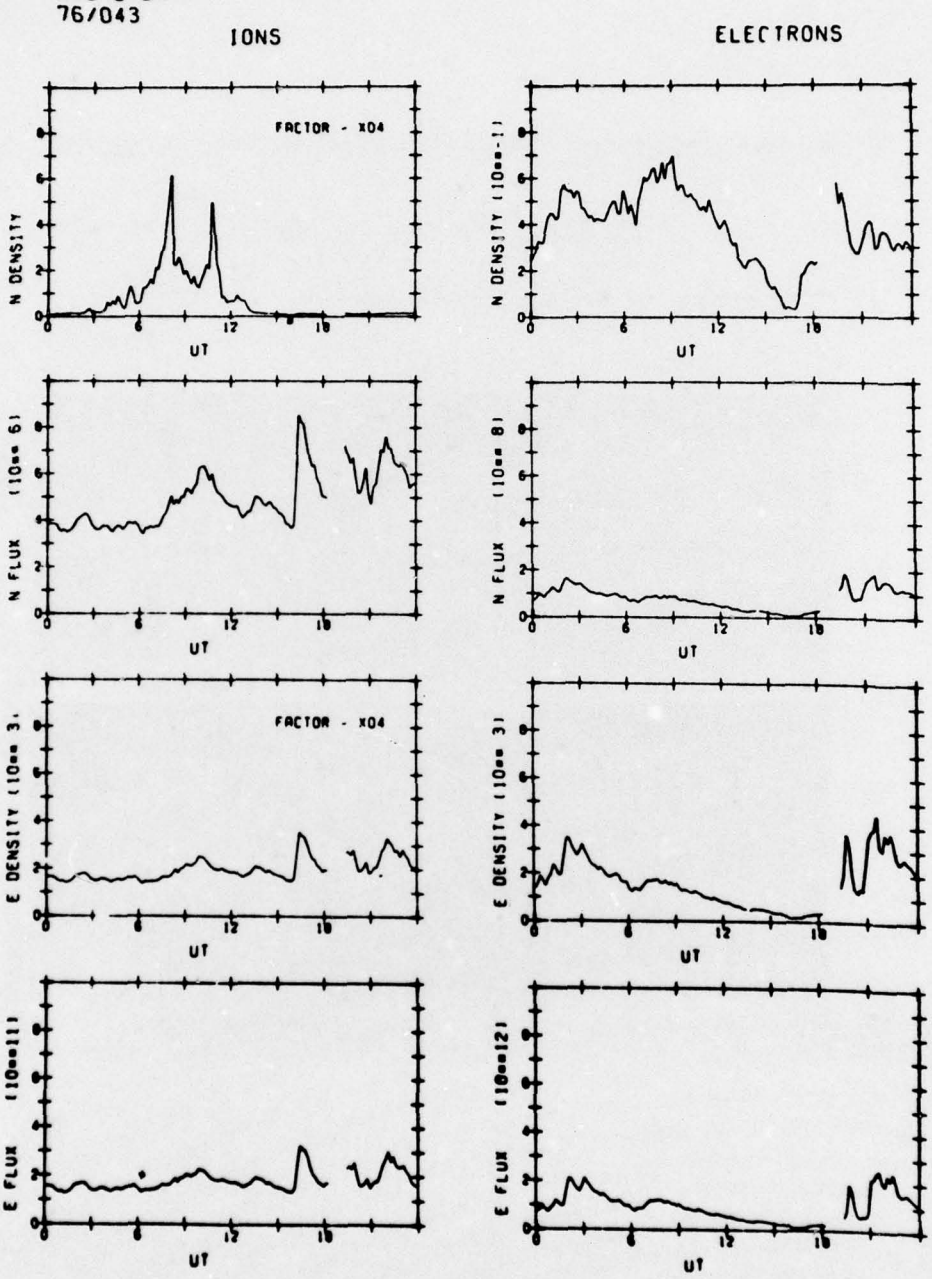
90
100
0
BEZ
B_x
0
-90
45
NSPA
-50
0
2/10/76
10000
1000
N/S
ELECTRONS
100
10
ENERGY
IN EV
0
0
10
100
N/S
IONS
1000
10000
3
2
1
0
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24
UCSD,ATS-6
DAY 41 OF 1976
RUN 10/ 4/78

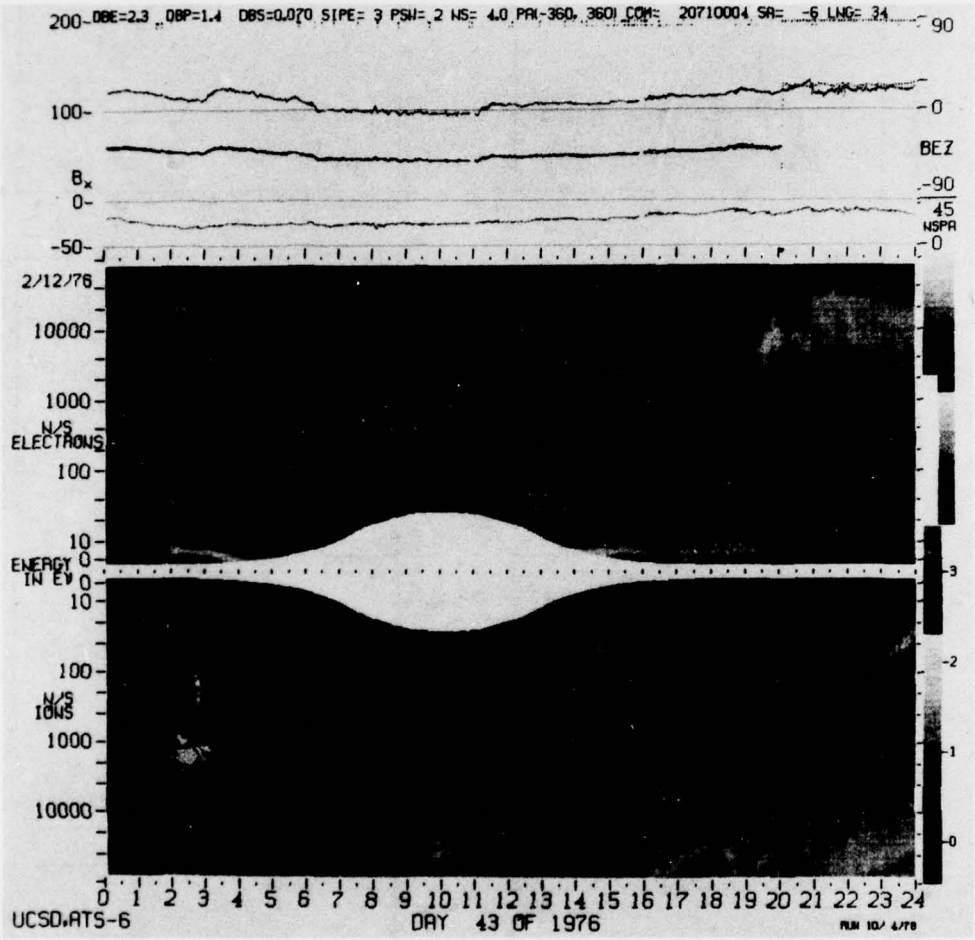
ATS-6 DATA
76/042



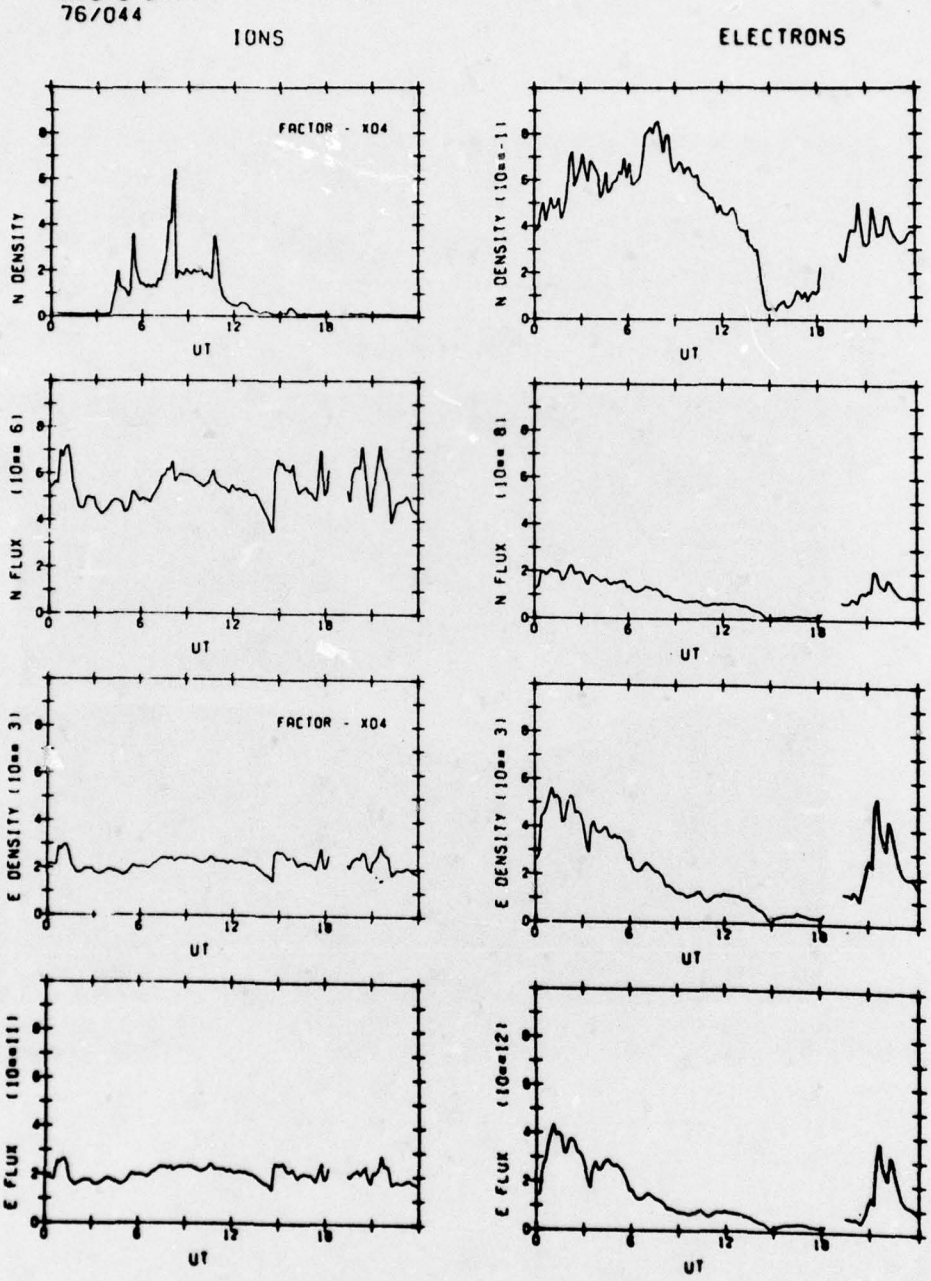

200
DBE=2.3 DBP=1.4 DBS=0.070 SIPE= 3 PSW= 2 NS= 4.0 PA=-360. 360. COME 207731 L4 SA= -6 LNG= 34
90
100
0
BEZ
B_x
0
-50
-90
45
NSPA
0
2/11/76
10000
1000
N/S ELECTRONS
100
10
ENERGY IN EV
0
0
10
100
N/S IONS
1000
10000
3
2
1
0
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24
UCSD.ATS-6
DAY 42 OF 1976

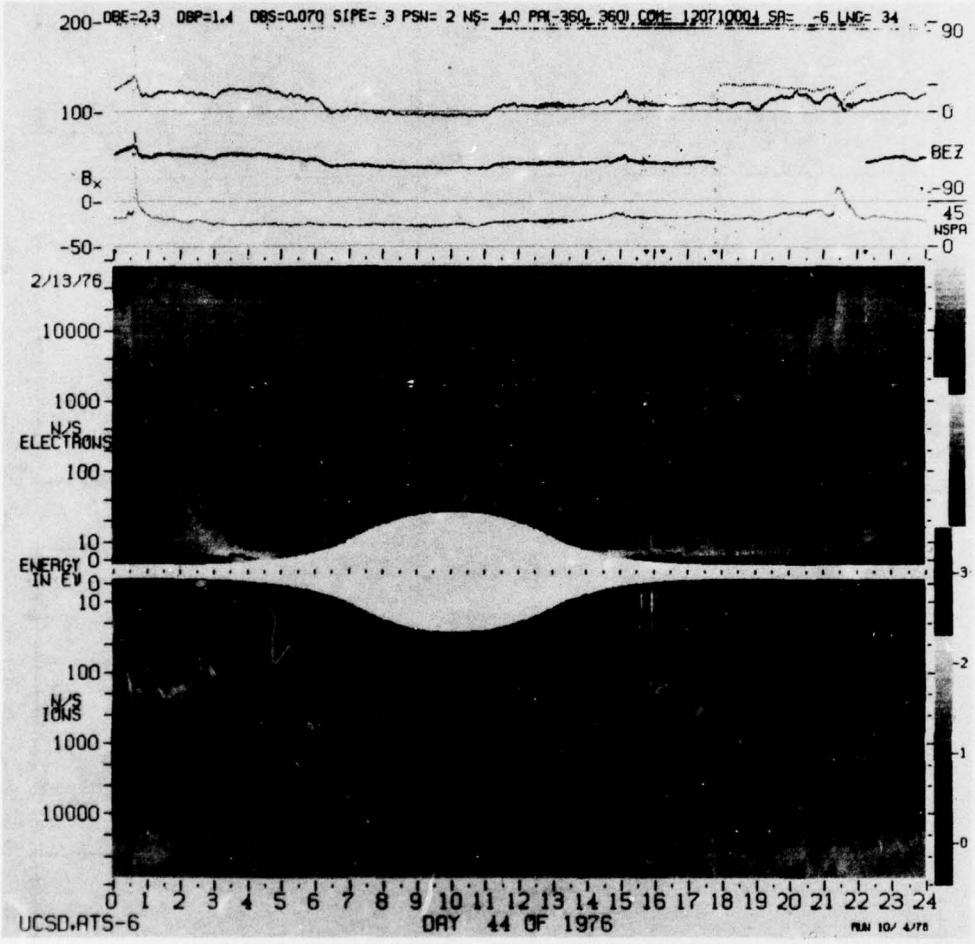
ATS-6 DATA
76/043

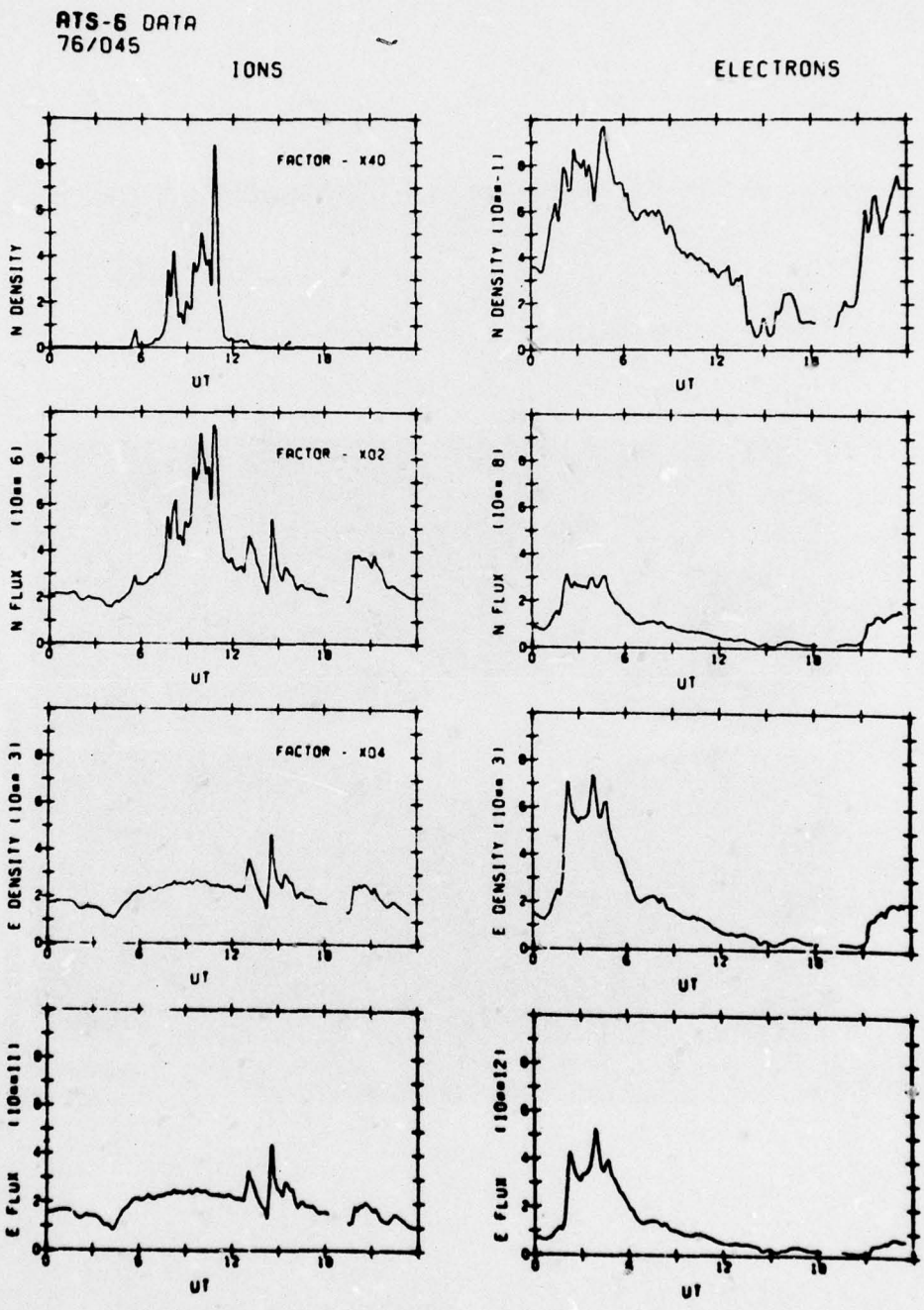


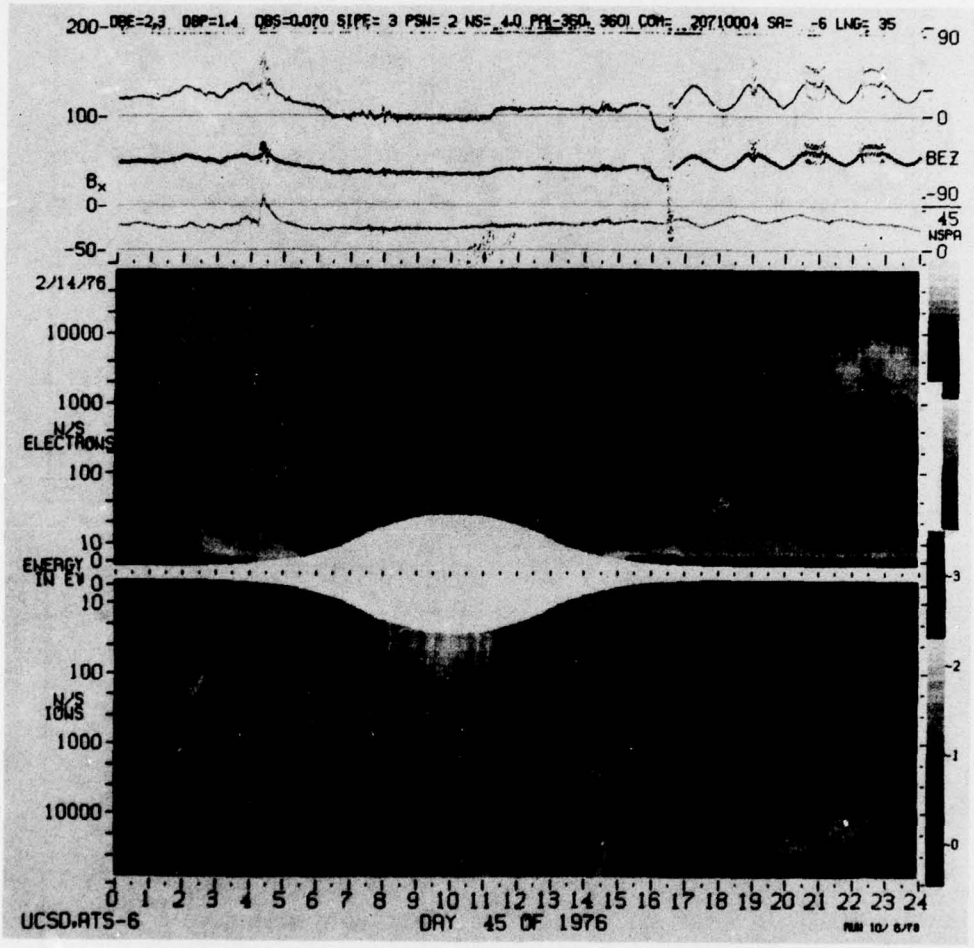

DBE=2.3 DBP=1.4 DBS=0.070 SIPE= 3 PSW= 2 NS= 4.0 PA(-360, 360) COM= 20710004 SA= -6 LNG= 34
200
100
0
-50
B_x
BEZ
90
0
-90
45
NSPA
0
2/12/76
10000
1000
W/S
ELECTRONS
100
10
0
ENERGY
IN EV
0
10
100
W/S
IONS
1000
10000
-3
-2
-1
-0
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24
UCSD,ATS-6
DAY 43 OF 1976

ATS-6 DATA
76/044




DBE=2.3 DBP=1.4 DBS=0.070 SIPE= 3 PSW= 2 NS= 4.0 PR(-360, 360) COM= 120710004 SA= -6 LNG= 34
200
100
0
-50
BEZ
90
0
-90
45
WSPR
0
2/13/76
10000
1000
N/S
ELECTRONS
100
10
ENERGY
IN EV
0
10
100
N/S
IONS
1000
10000
3
2
1
0
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24
UCSD.ATS-6
DAY 44 OF 1976


ATS-6 DATA
76/045
IONS
ELECTRONS
FACTOR - X40
FACTOR - X02
FACTOR - X04
N DENSITY
N DENSITY (10**-1)
N FLUX (10** 6)
N FLUX (10** 8)
E DENSITY (10** 3)
E DENSITY (10** 3)
E FLUX (10**11)
E FLUX (10**12)
UT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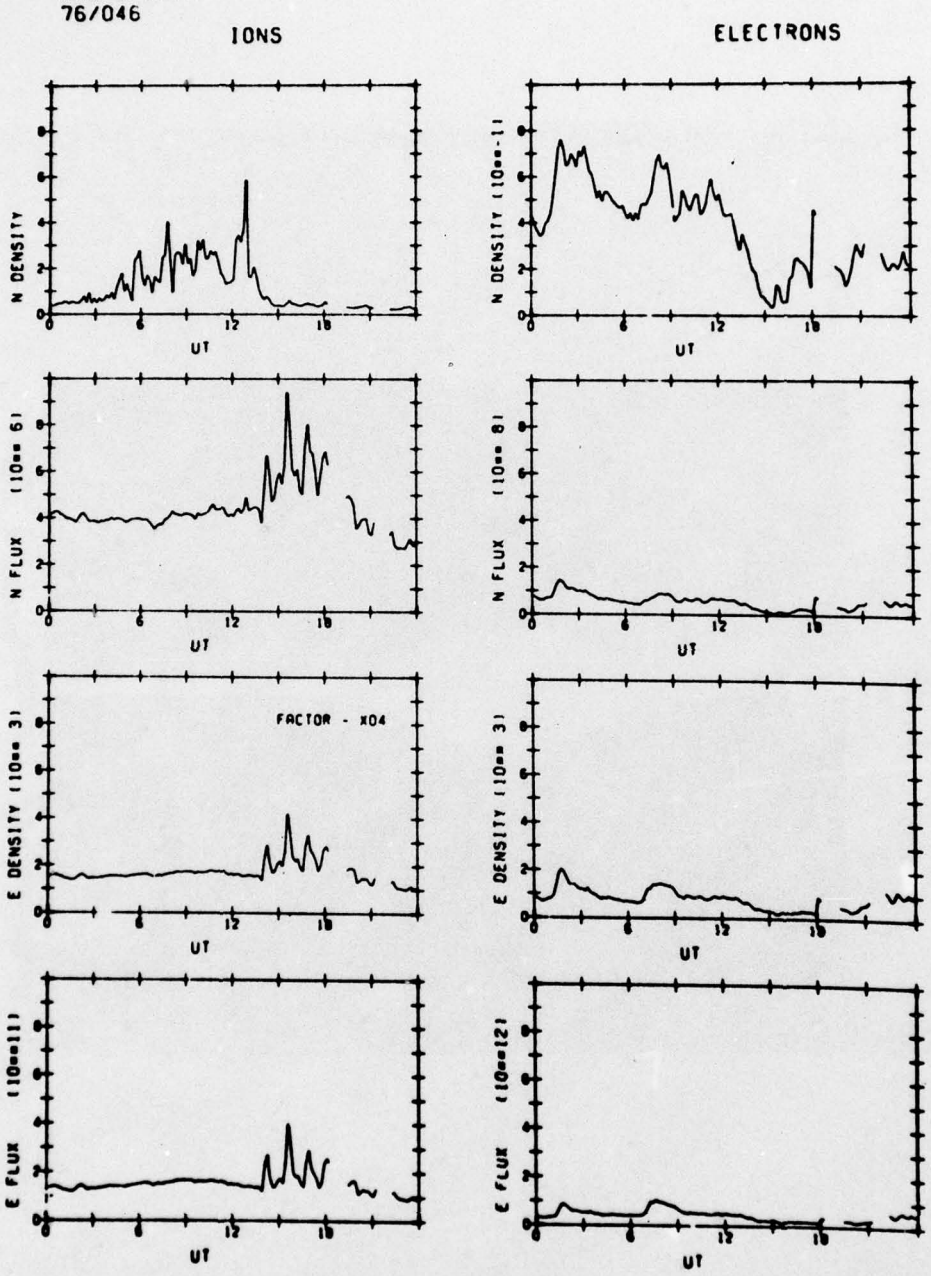
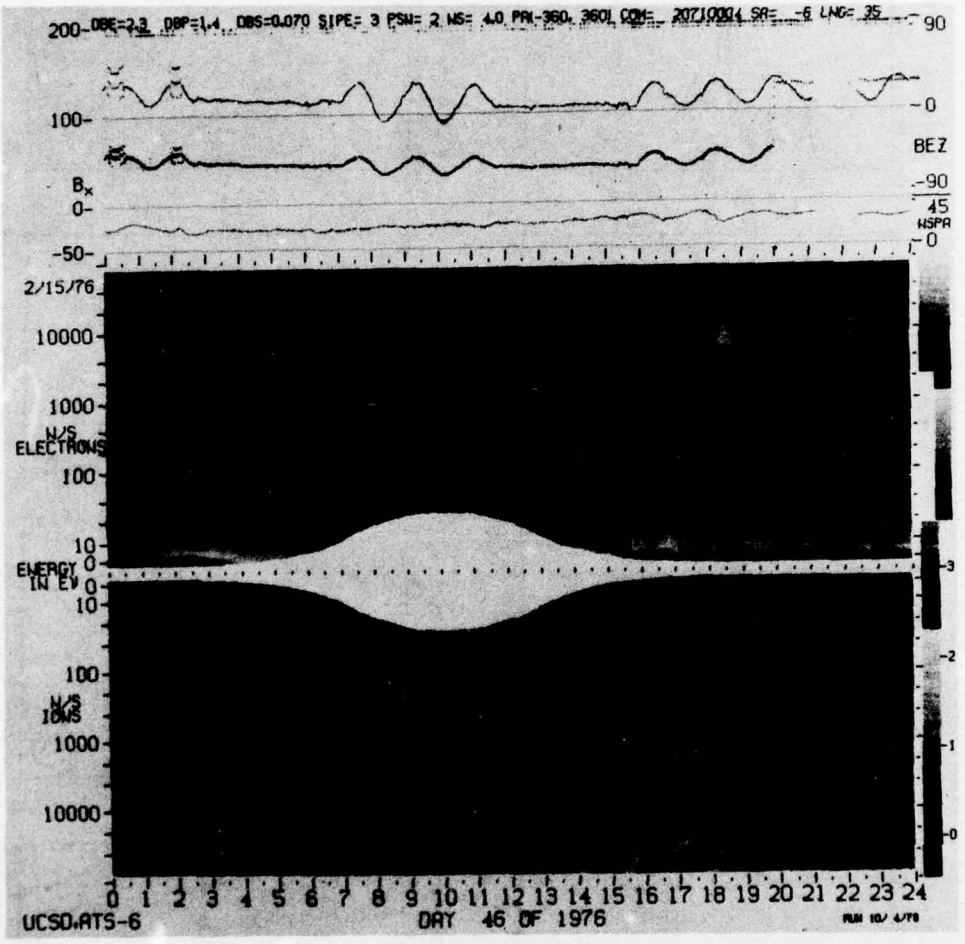
200
100
0
-50
B_x
BEZ
WSPA
90
-90
45
0
2/14/76
10000
1000
N/S
ELECTRONS
100
10
ENERGY
IN EV
0
10
100
N/S
IONS
1000
10000
-3
-2
-1
0
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24
UCSD,ATS-6
DAY 45 OF 1976

ATS-6 DATA
76/046

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90
100
0
BEZ
-90
B_x
0
45
WSPR
0
-50
2/15/76
10000
1000
N/S
ELECTRONS
100
10
0
ENERGY
IN EV
0
10
100
N/S
IONS
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10000
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0
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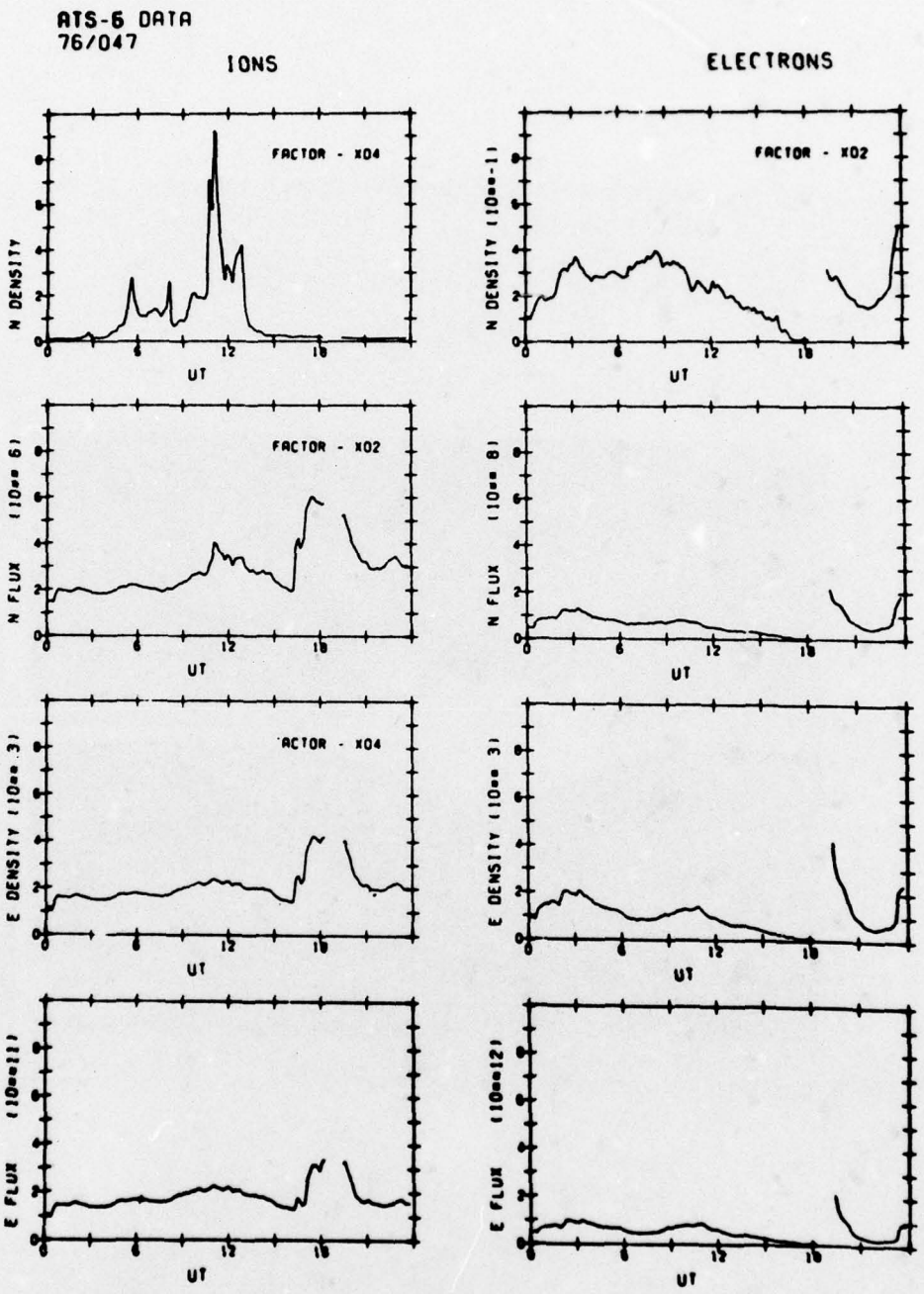
UCSD-ATS-6
DAY 46 OF 1976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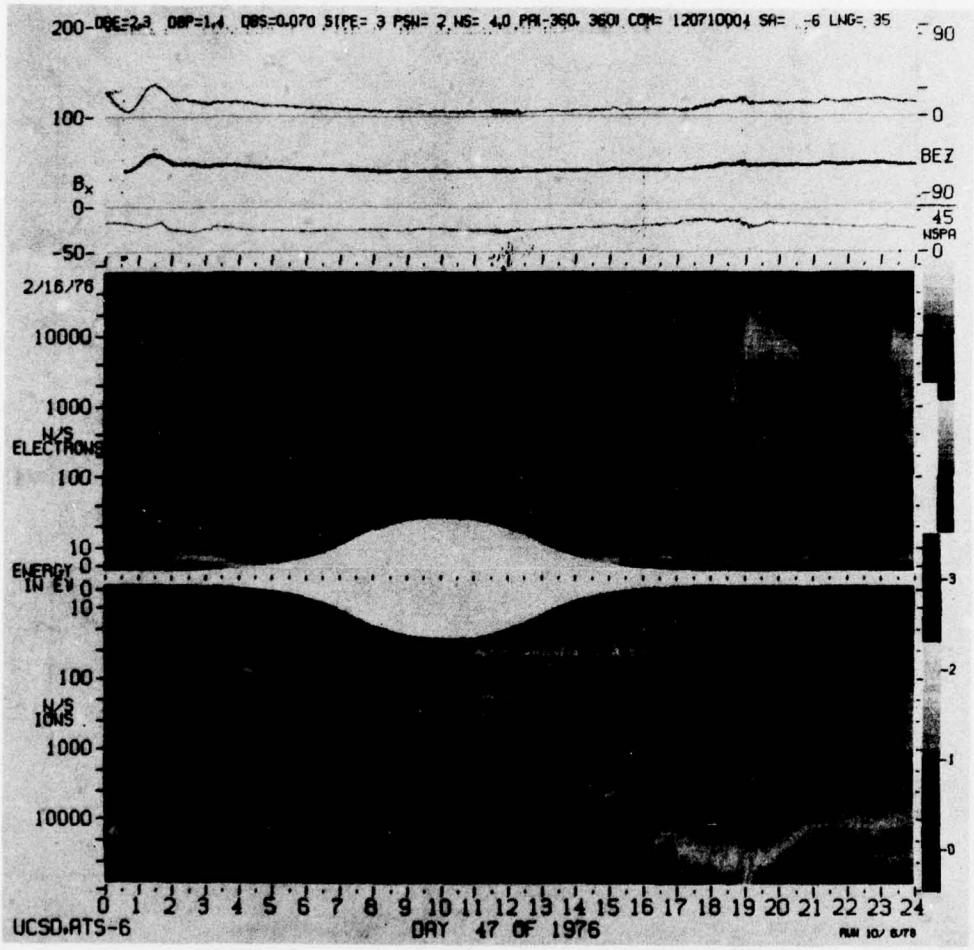
76/047
IONS
ELECTRONS
FACTOR - X04
FACTOR - X02
N DENSITY
N DENSITY (10**-1)
FACTOR - X02
FACTOR - X04
N FLUX (10** 6)
N FLUX (10** 8)
E DENSITY (10** 3)
E DENSITY (10** 3)
E FLUX (10**11)
E FLUX (10**12)
UT
0
6
12
18
2
4
6
8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100-
0-
-50-
Bx
BEZ
NSPA
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-90
45
2/16/76
10000
1000
N/S
ELECTRONS
100
10
ENERGY
IN EV
IONS
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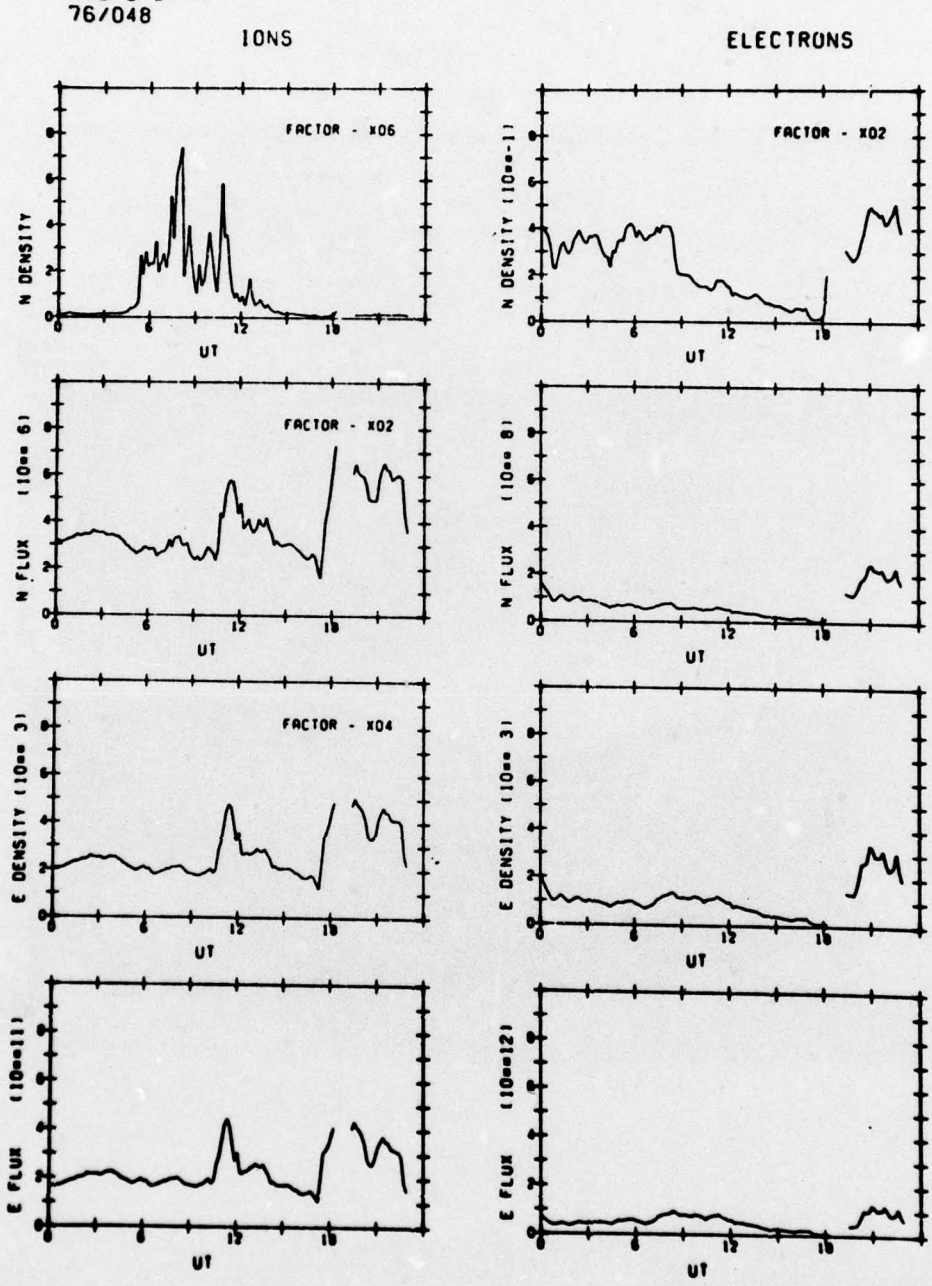
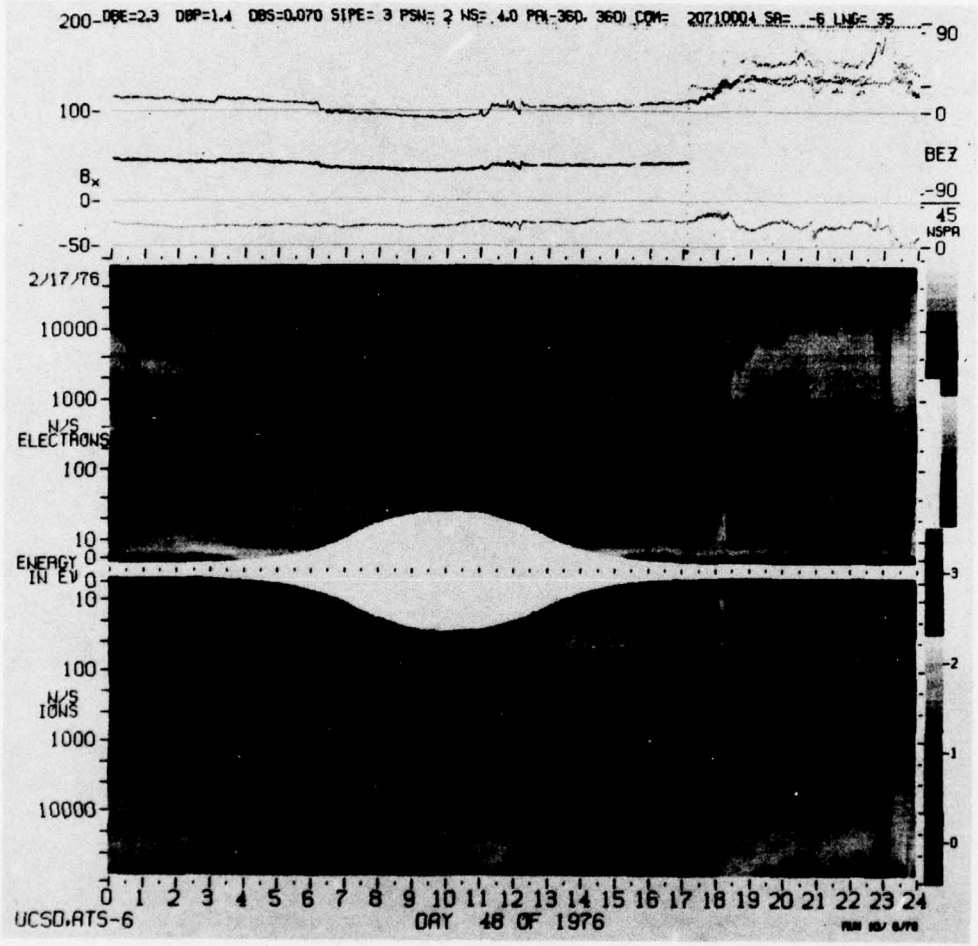
UCSD-ATS-6
DAY 47 OF 1976

ATS-6 DATA
76/048

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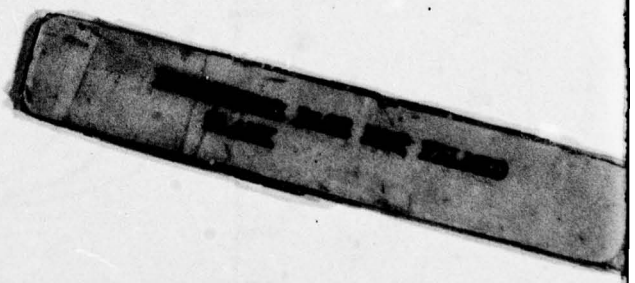
100
90
0
BEZ
B_x
0
-50
-90
45
WSPA
0
2/17/76
10000
1000
N/S
ELECTRONS
100
10
ENERGY
IN EV
0
0
10
100
N/S
IONS
1000
10000
3
2
1
0
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24
UCSD,ATS-6
DAY 48 OF 1976

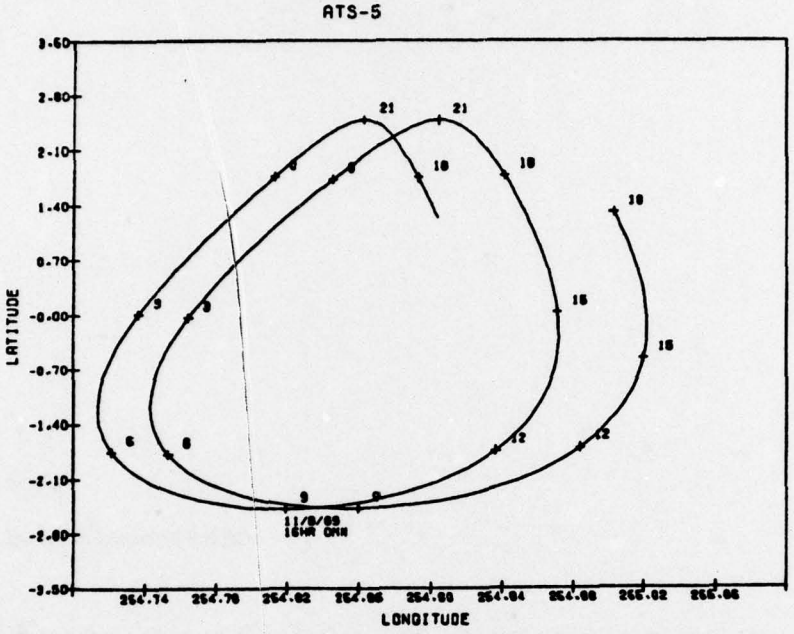
Appendix B

Orbital Elements of ATS-5 and ATS-6

As discussed in the text, this appendix contains plots of the orbital elements for ATS-5 and ATS-6 for the days listed in Table 1. For each satellite the latitude *vs* longitude in geographic coordinates are shown first. The dates at the top indicate the start and stop times (that is, 11/8/69-11/10/69 0HR 0MN means the plot started on 8 November 1969 at 0000 UT and ended on 10 November 1969 at 0000 UT). The second set in each case are the radial distance in km from the center of the earth *vs* day of the year (Jan 1 - Day 1). AFGL/SUA (E. Robinson) should be consulted for any questions concerning these elements.

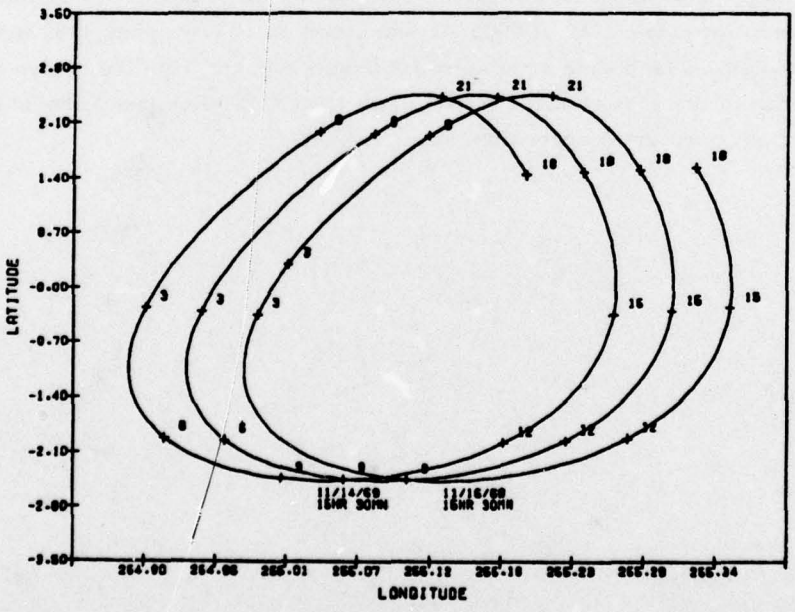


ATS-5 11/ 8/69 11/10/69 0HR 0MN



COMMAND-

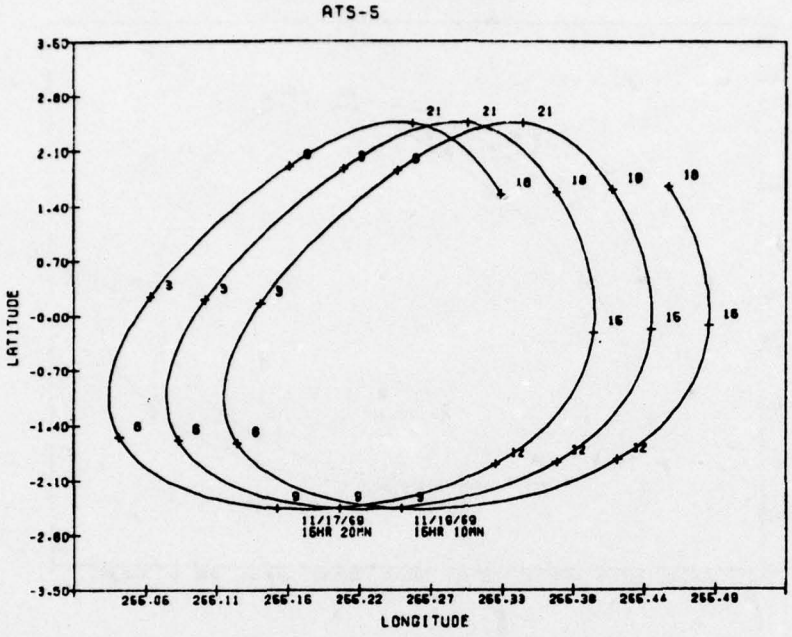
ATS-5 11/14/69 11/17/69 0HR 0MN



COMMAND-

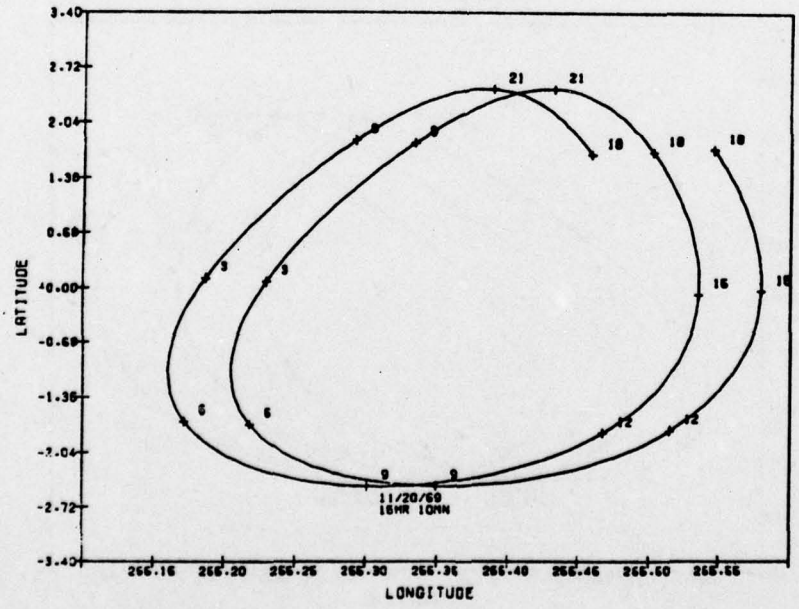
COMMAND-

ATS-5 11/17/69 11/20/69 0HR 0MN

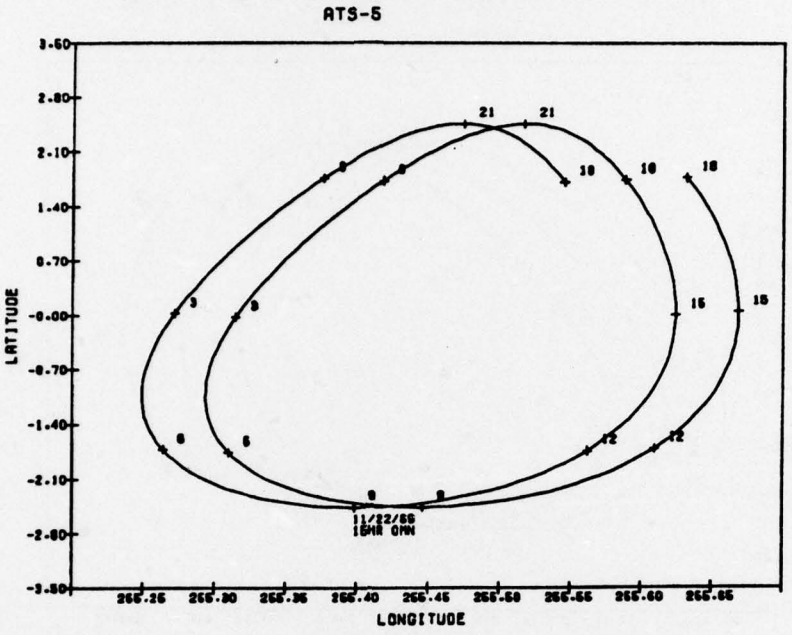


COMMAND-

ATS-5 11/20/69 11/22/69 0HR 0MN



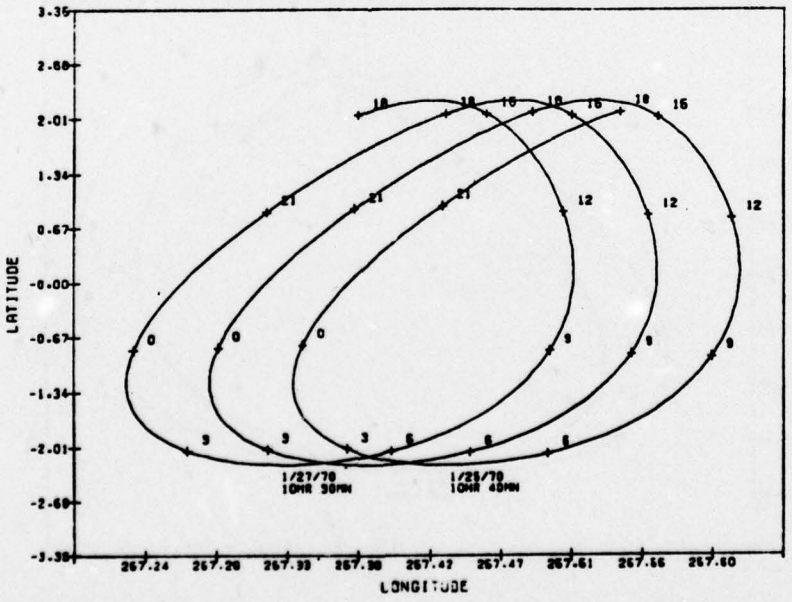
ATS-5 11/22/69 11/24/69 0HR 0MN



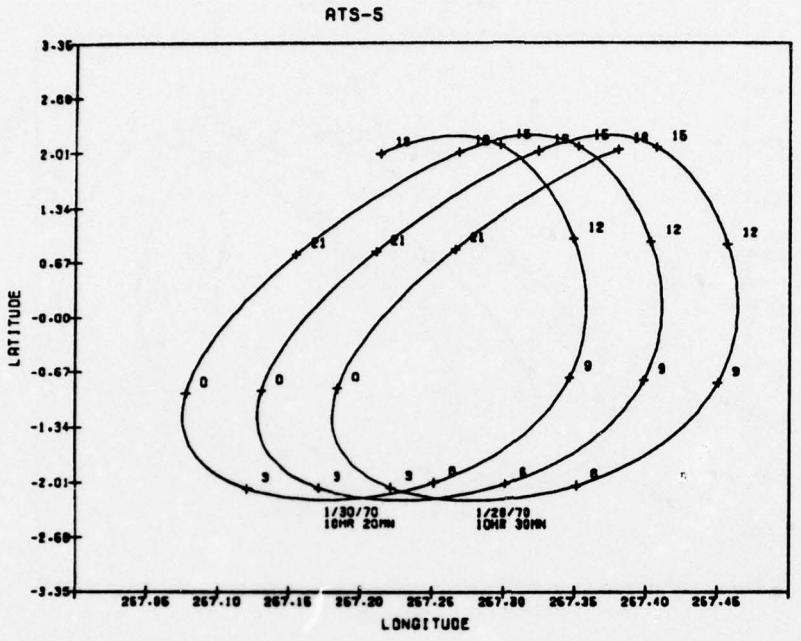
COMMAND-

COMMAND-

ATS-5 1/25/70 1/28/70 0HR 0MN

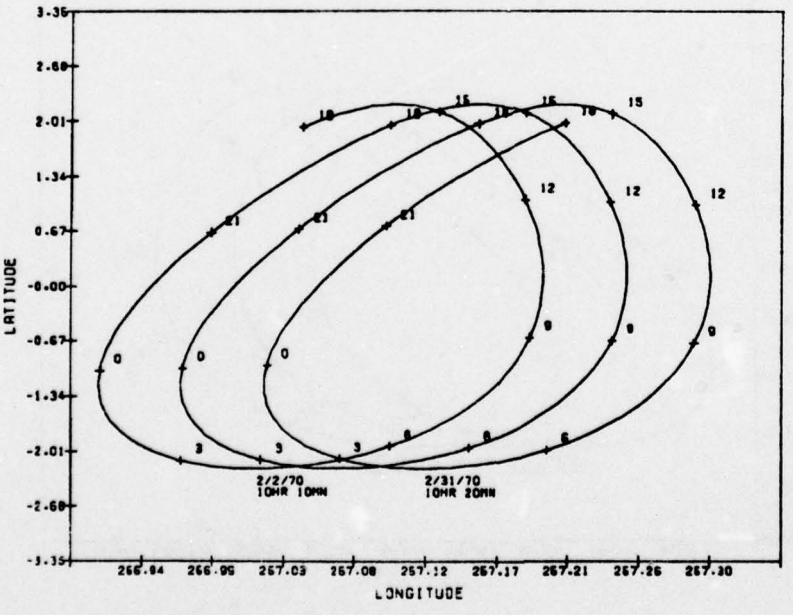


ATS-5 1/28/70 1/31/70 0HR 0MN

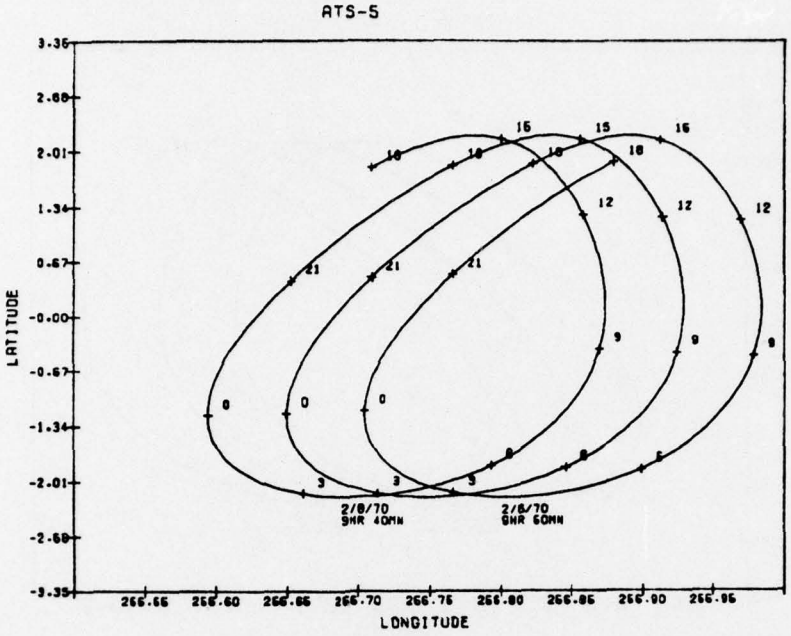


COMMAND-

ATS-5 1/31/70 2/ 3/70 0HR 0MN

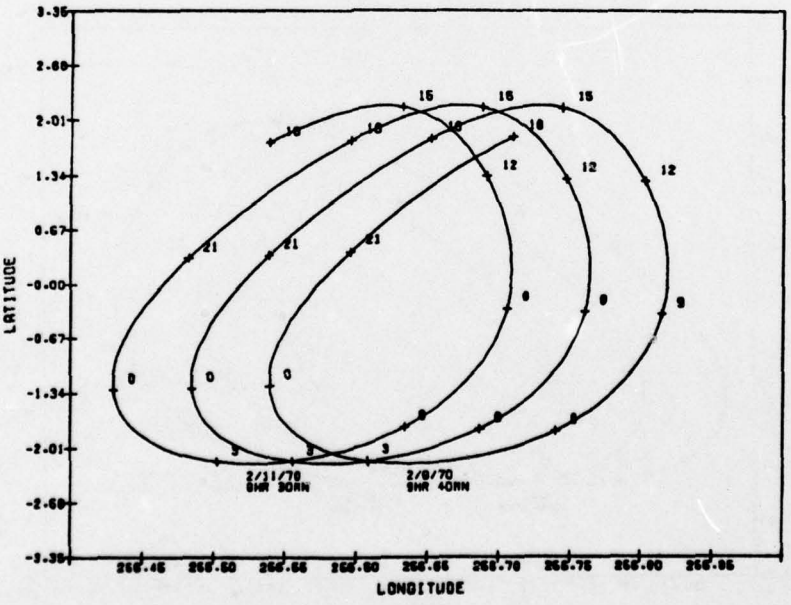


ATS-5 2/ 6/70 2/ 9/70 0HR 0MN



COMMAND-

ATS-5 2/ 9/70 2/12/70 0HR 0MN



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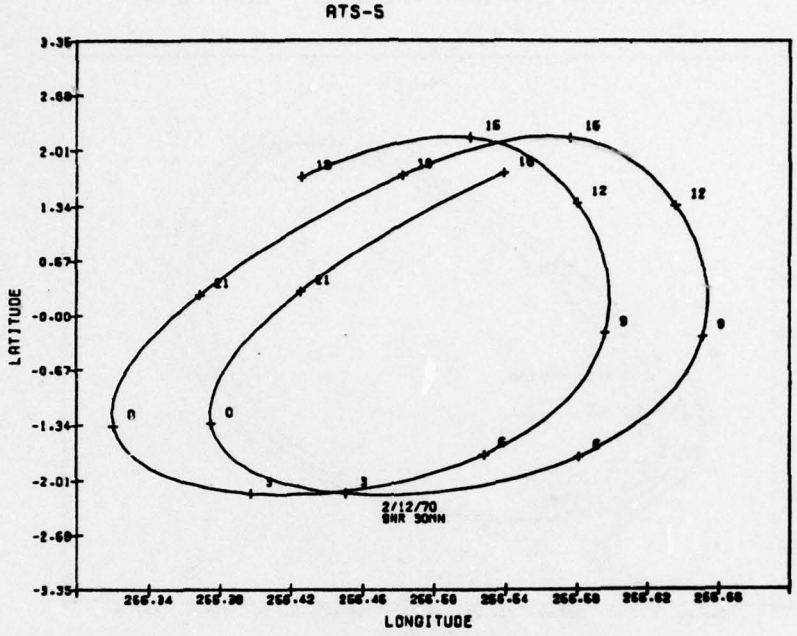
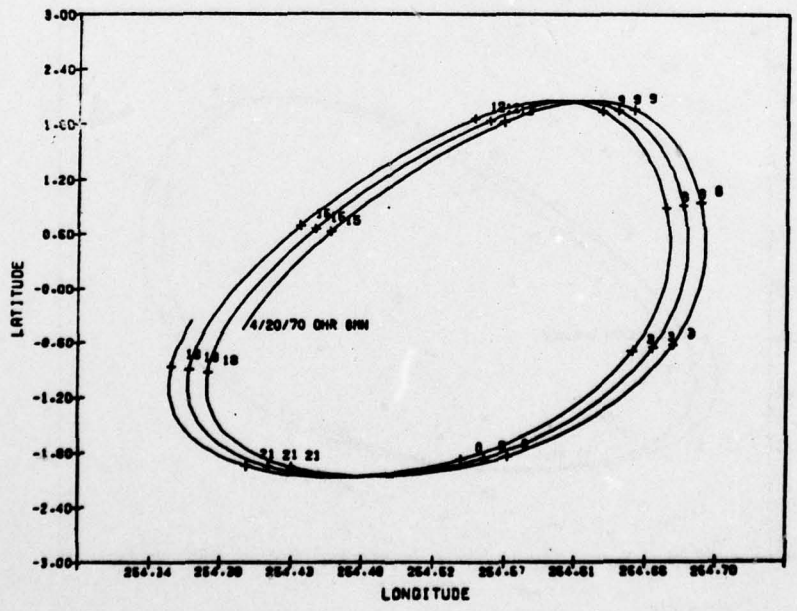
ATS-5 2/12/70 2/14/70 0HR 0MN



COMMAND-

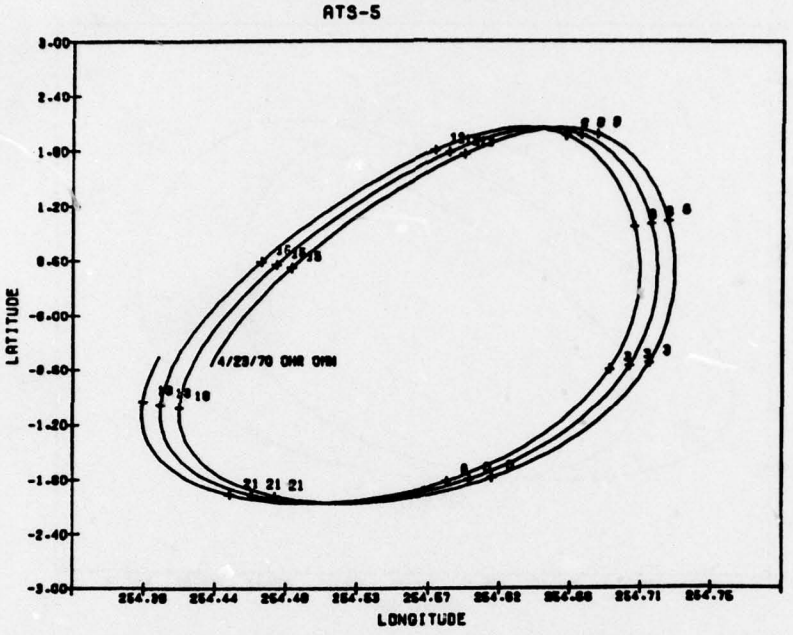
COMMAND-

ATS-5 4/17/70 4/20/70 0HR 0MN



COMMAND-

ATS-5 4/20/70 4/23/70 0HR 0MN



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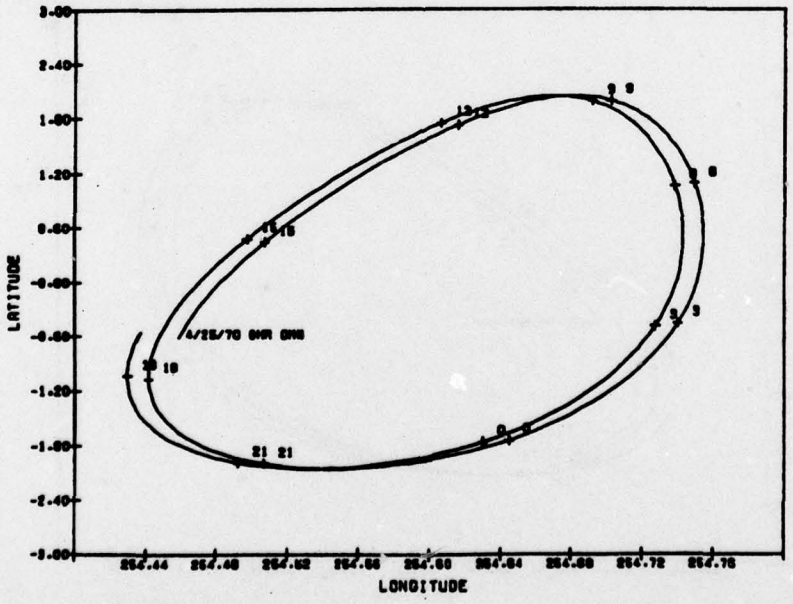
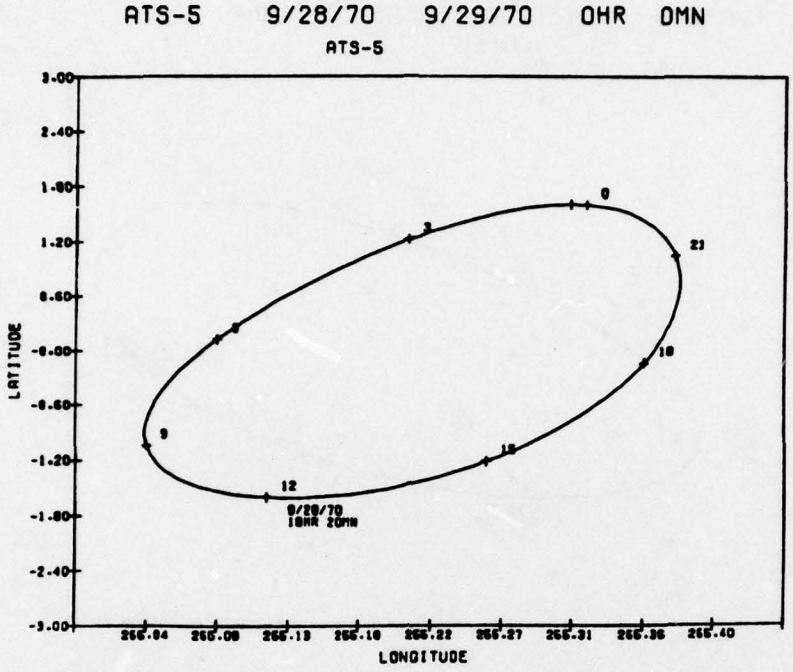


COMMAND-

COMMAND-

ATS-5 9/28/70 9/29/70 0HR 0MN



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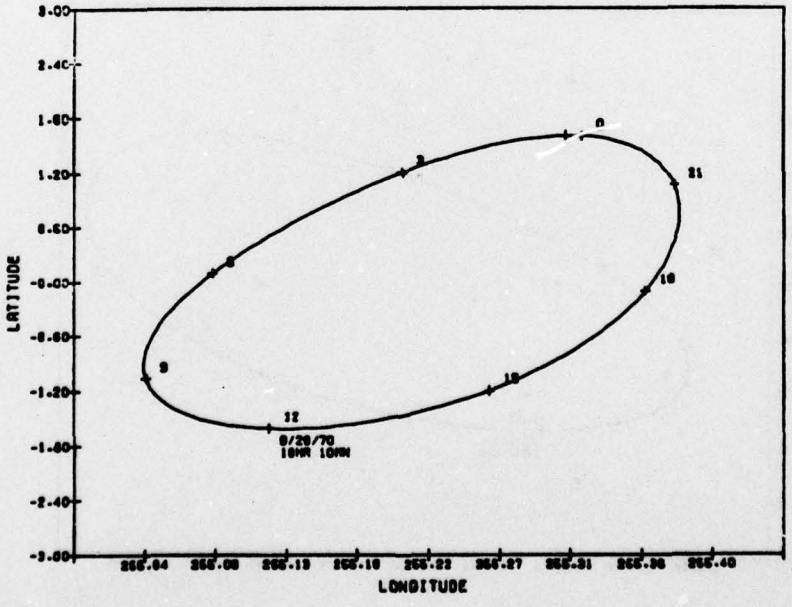

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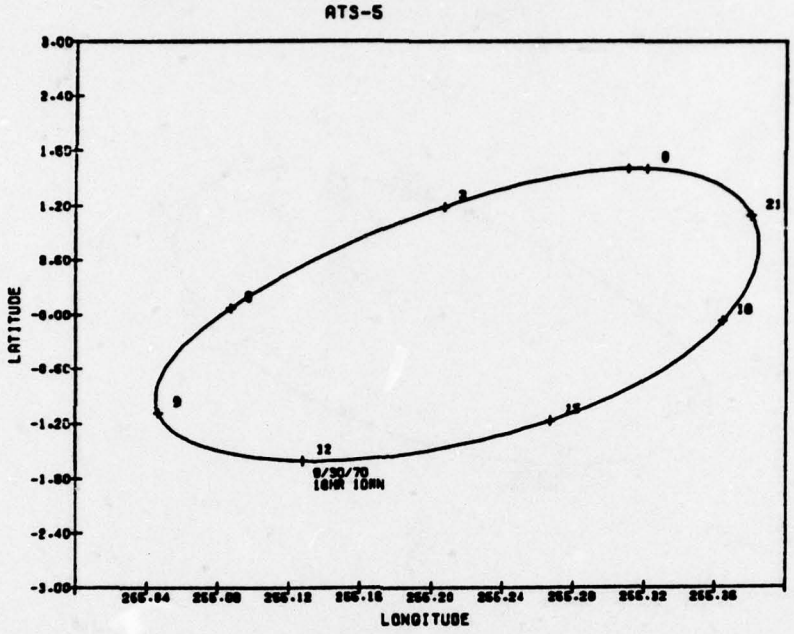

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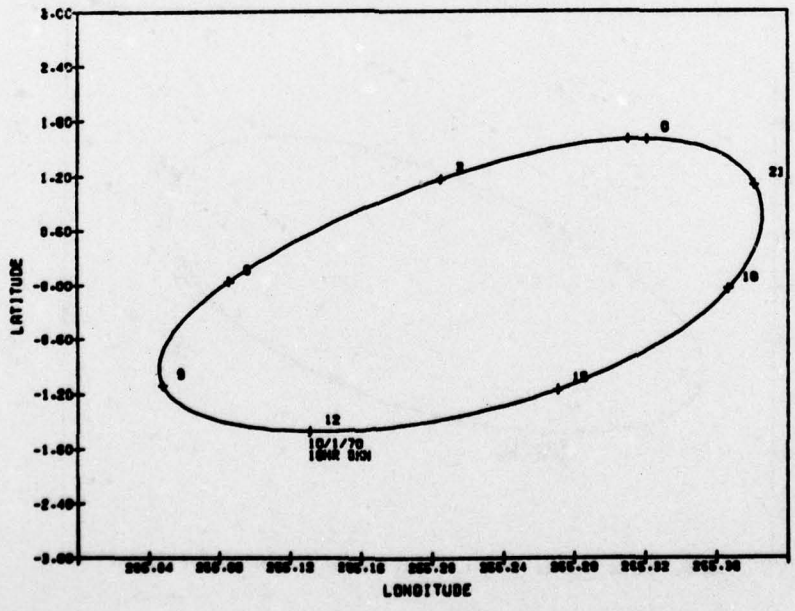

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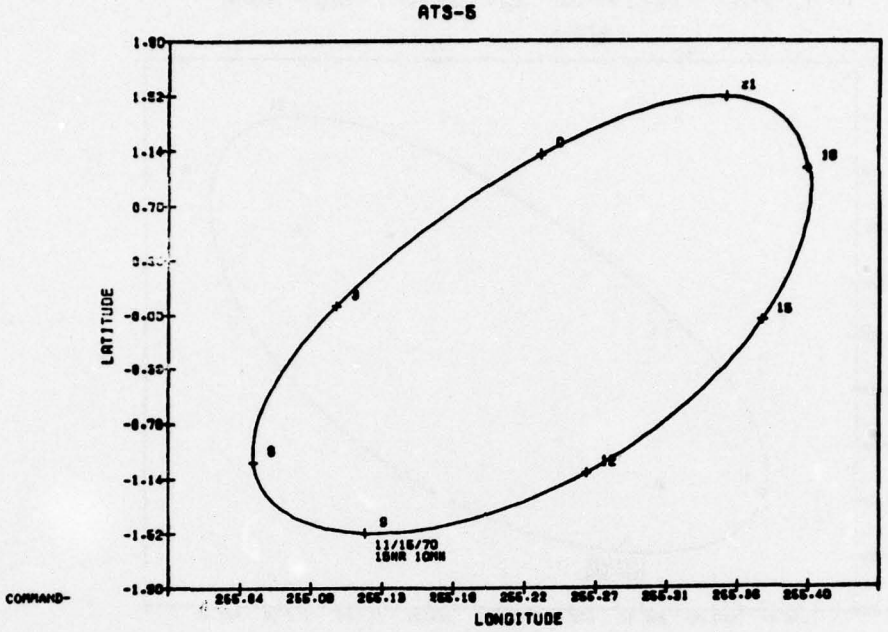
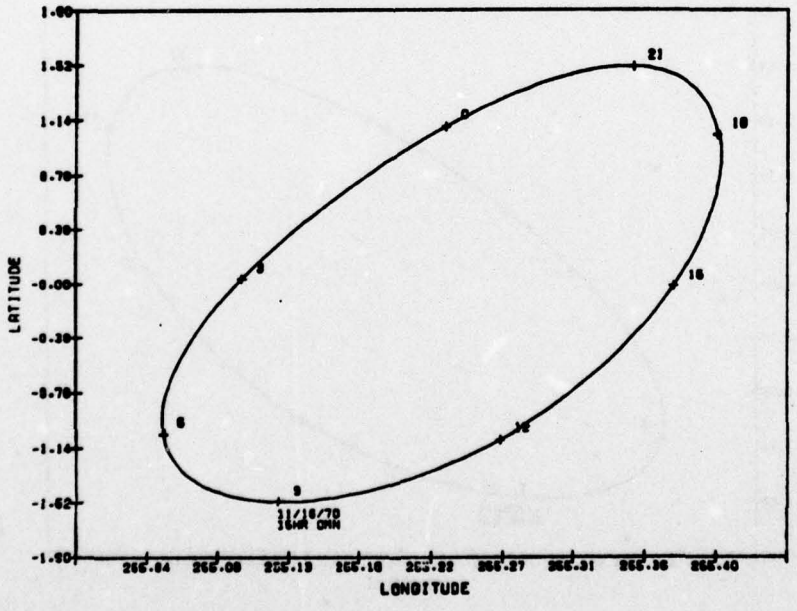
ATS-5 11/15/70 11/16/70 0HR 0MN



COMMAND-

ATS-5 11/16/70 11/17/70 0HR 0MN



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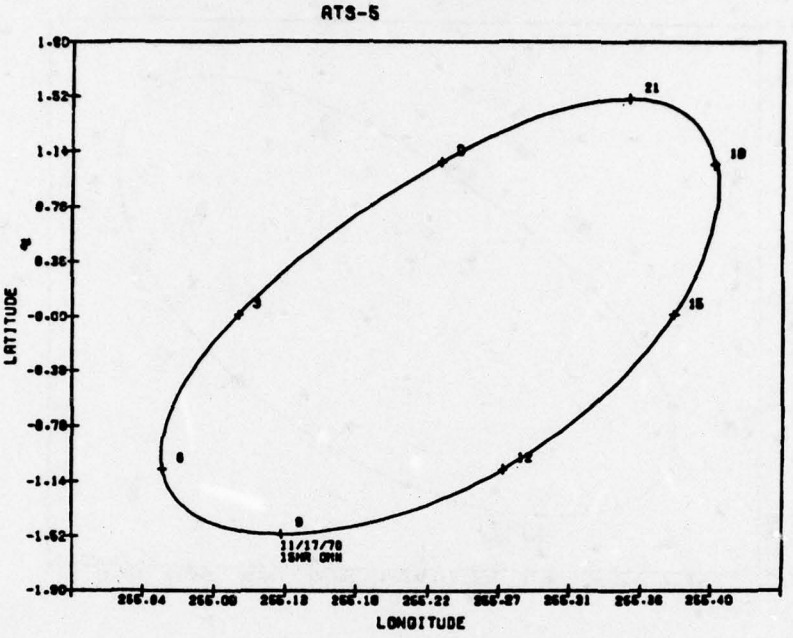
ATS-5 11/17/70 11/18/70 OHR OMN



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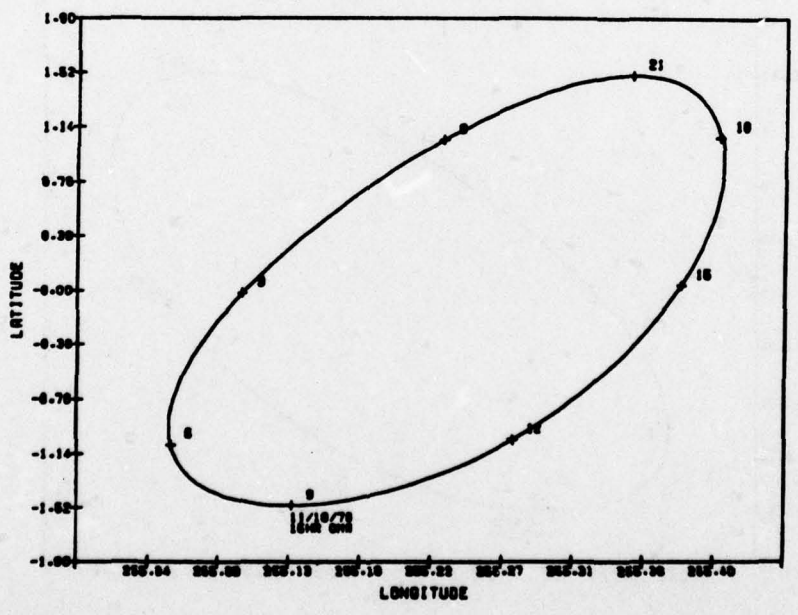

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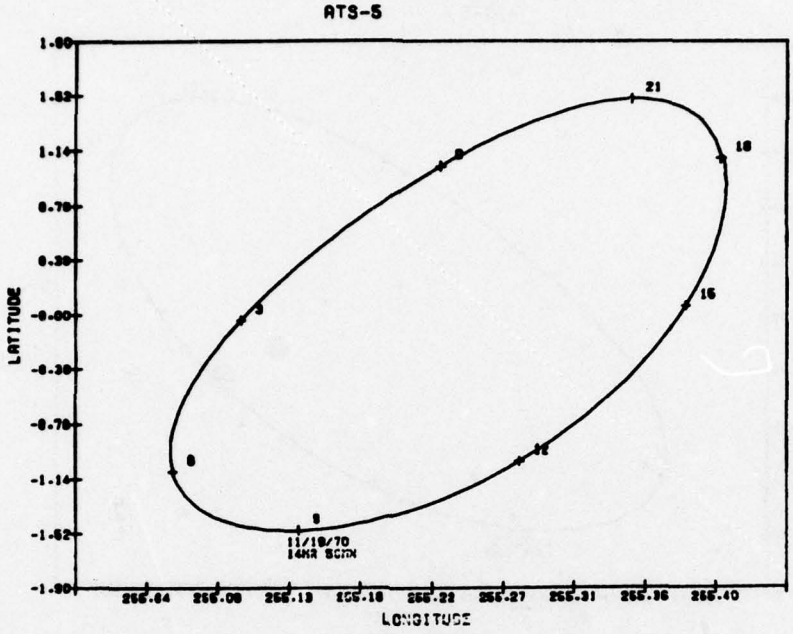

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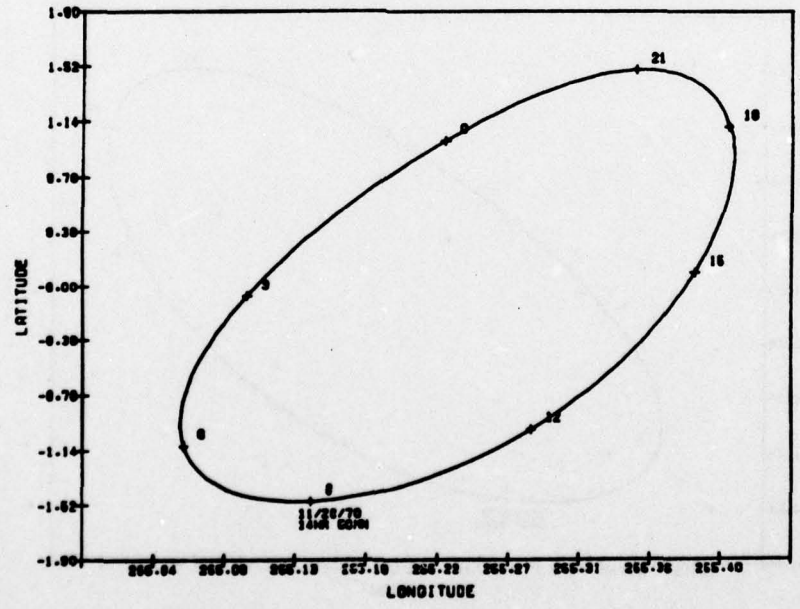

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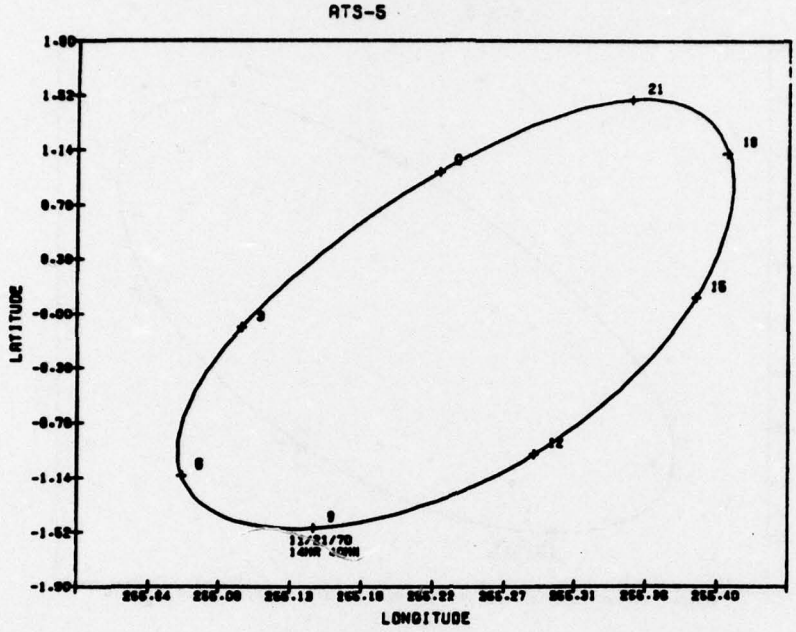
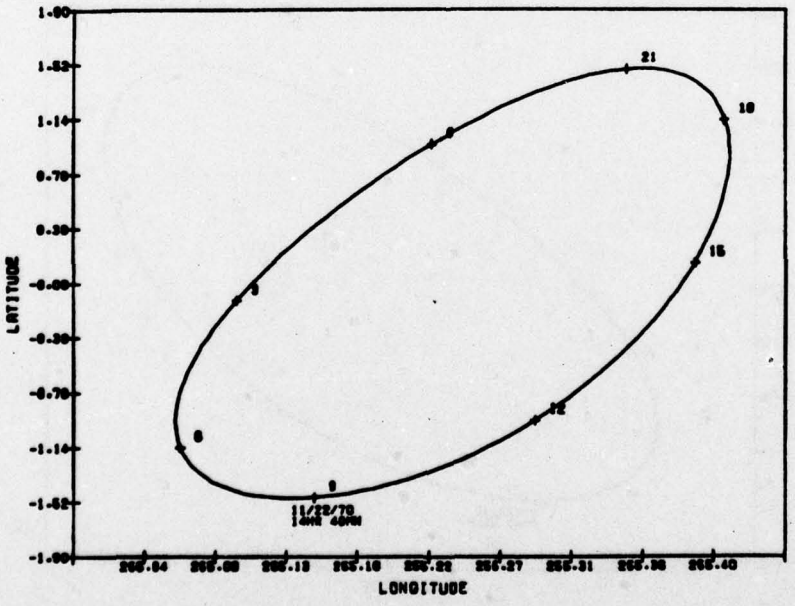
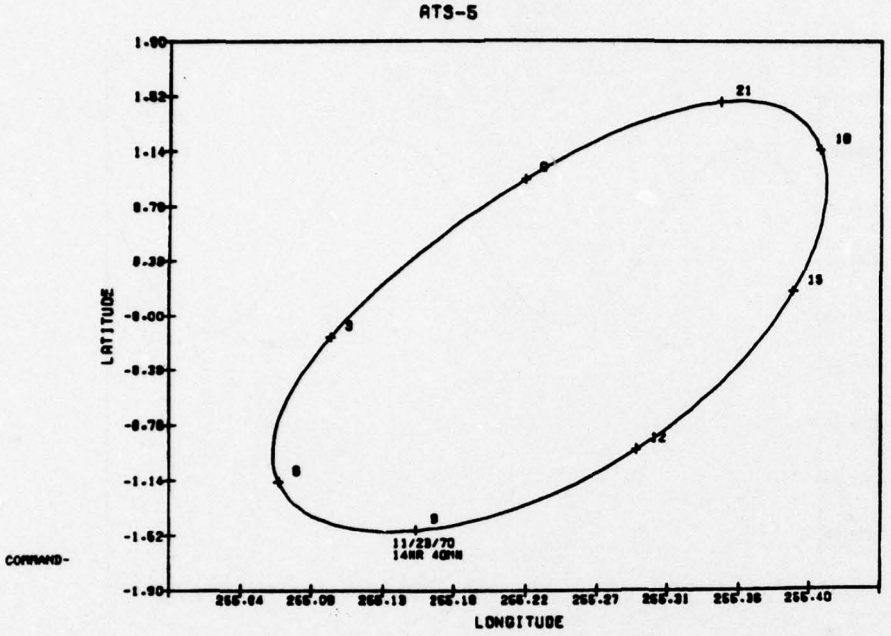


COMMAND-

ATS-5 11/22/70 11/23/70 0HR 0MN



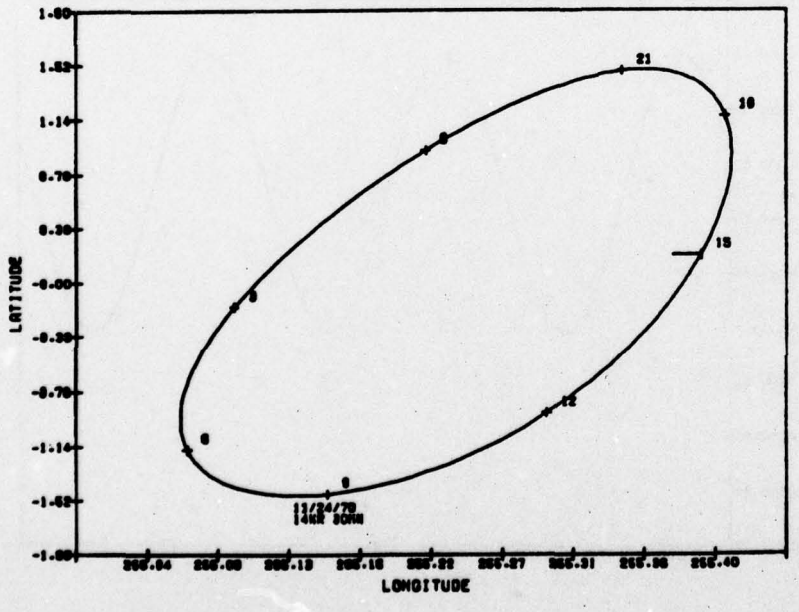
ATS-5 11/23/70 11/24/70 0HR 0MN



COMMAND-

COMMAND-

ATS-5 11/24/70 11/25/70 0HR 0MN



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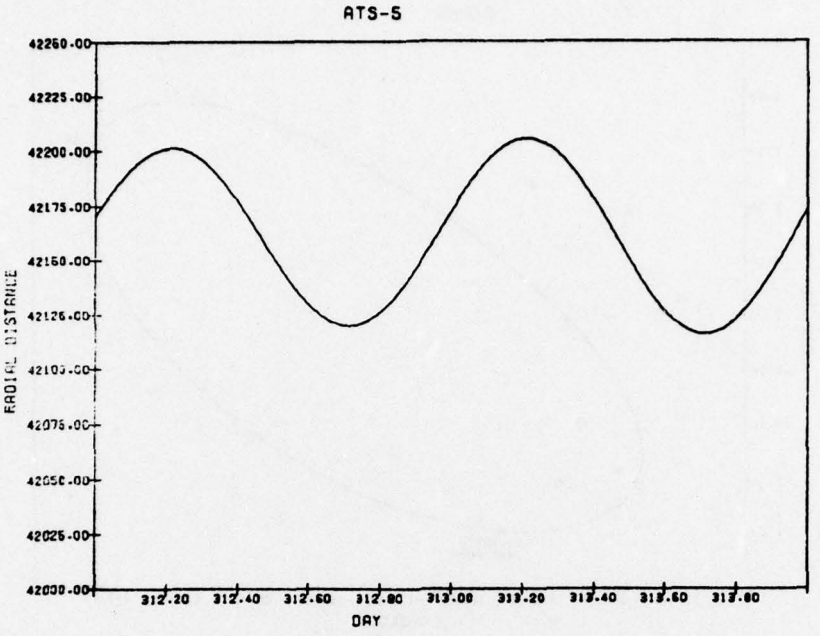

COMMAND-

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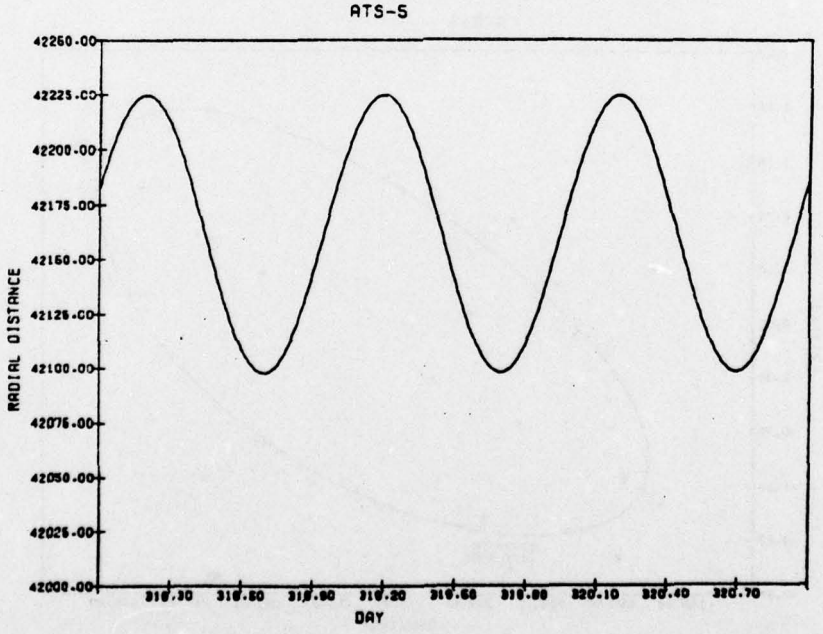

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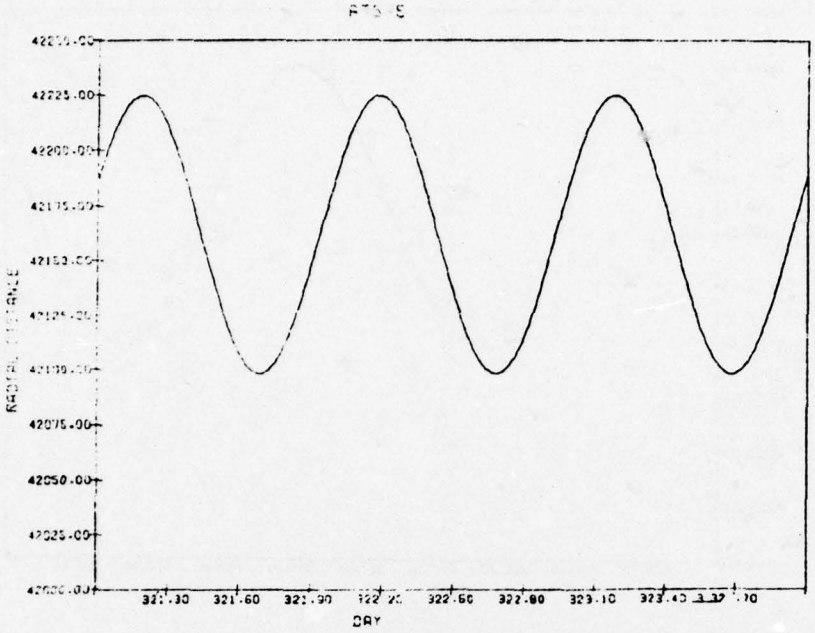

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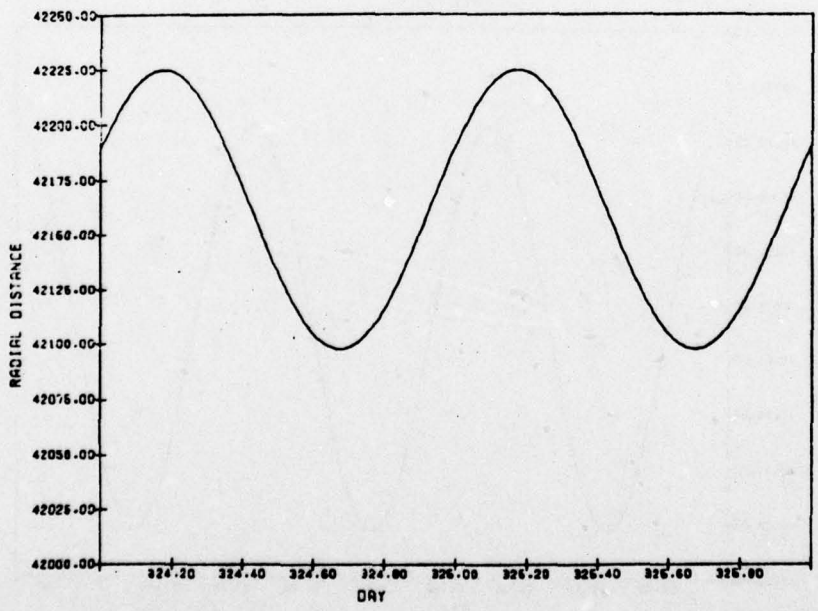

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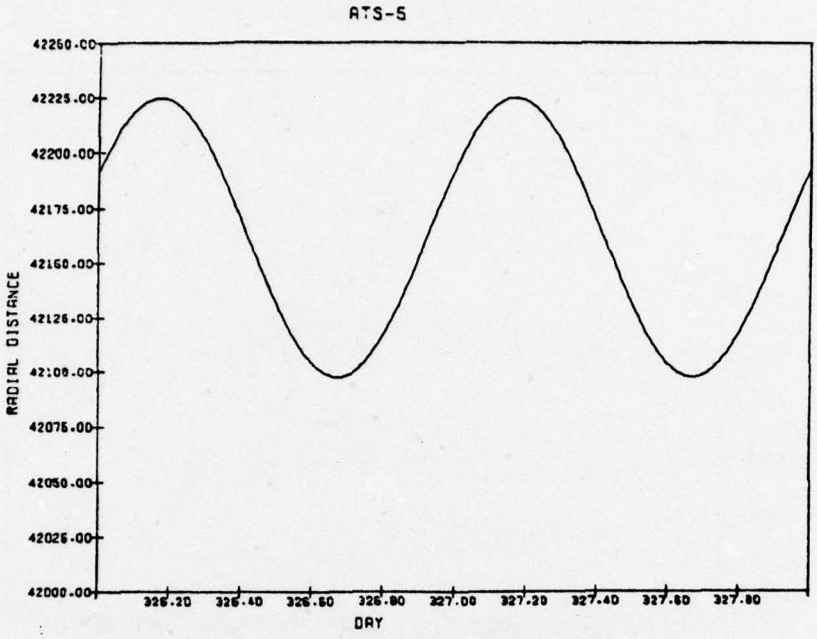
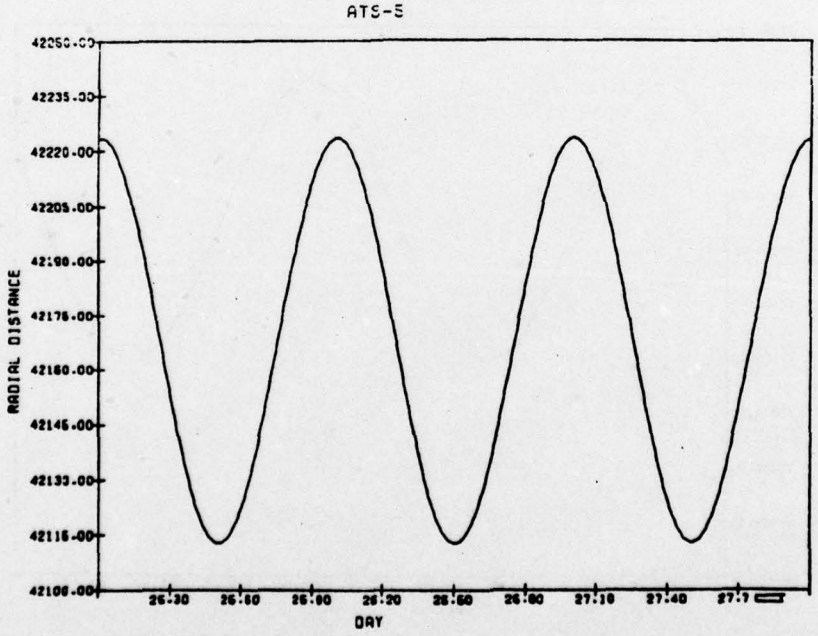


COMMAND-

COMMAND-

ATS-5 1/25/70 1/28/70 0HR 0MN



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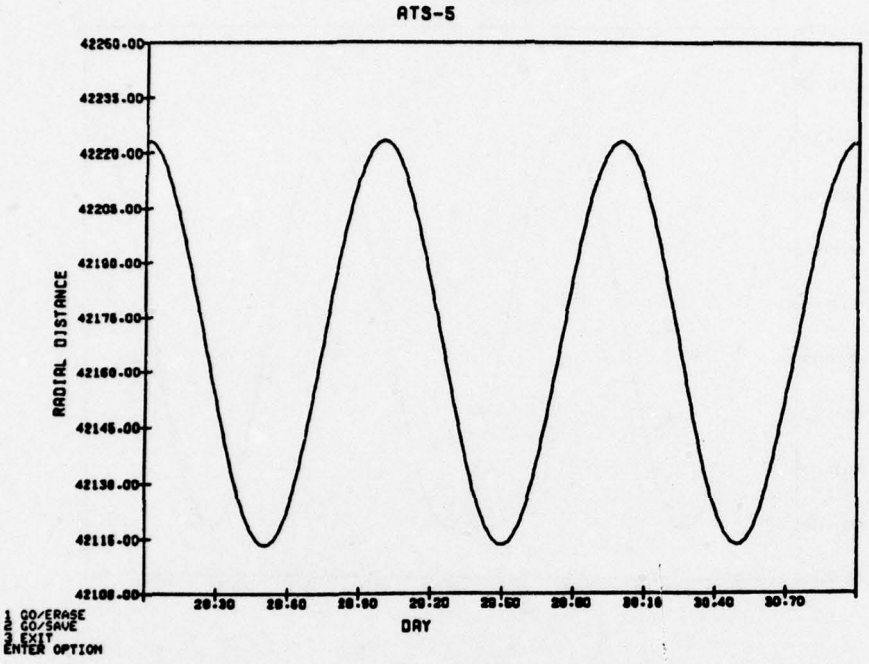
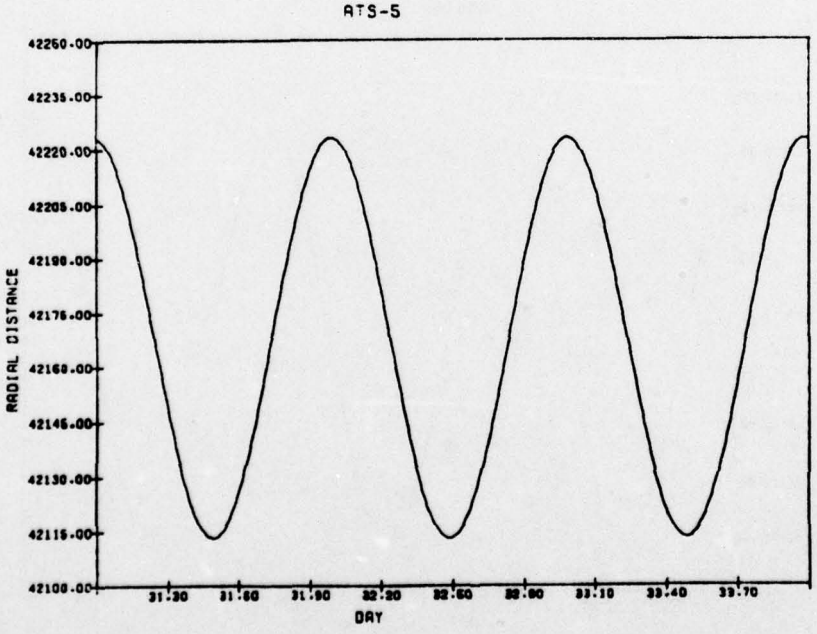
ATS-5 1/28/70 1/31/70 0HR 0MN

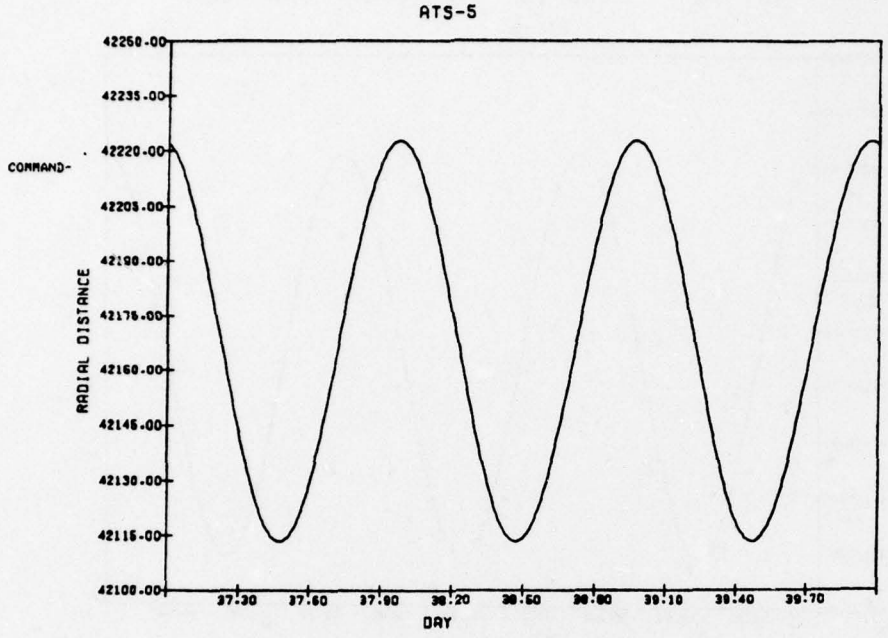


COMMAND-

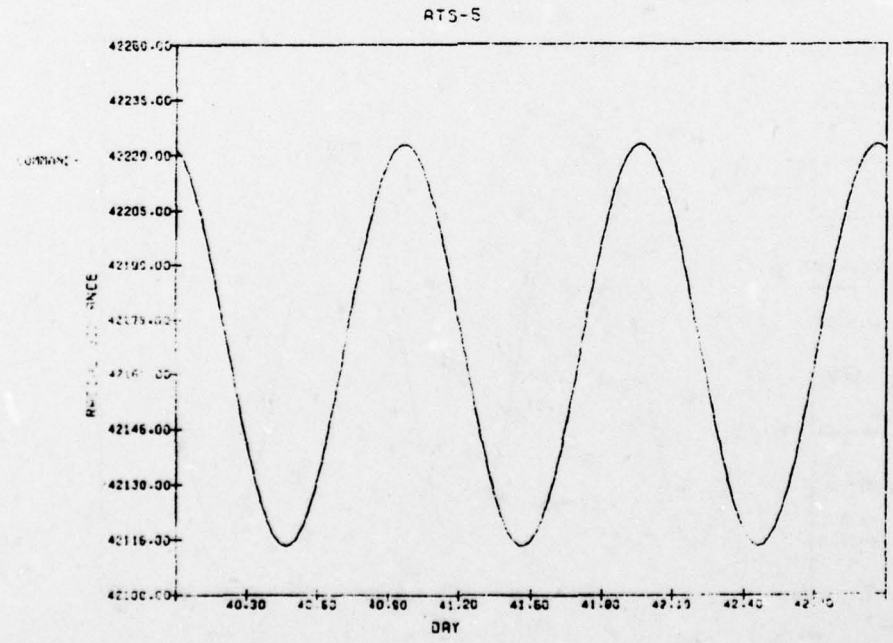
ATS-5 1/31/70 2/ 3/70 0HR 0MN



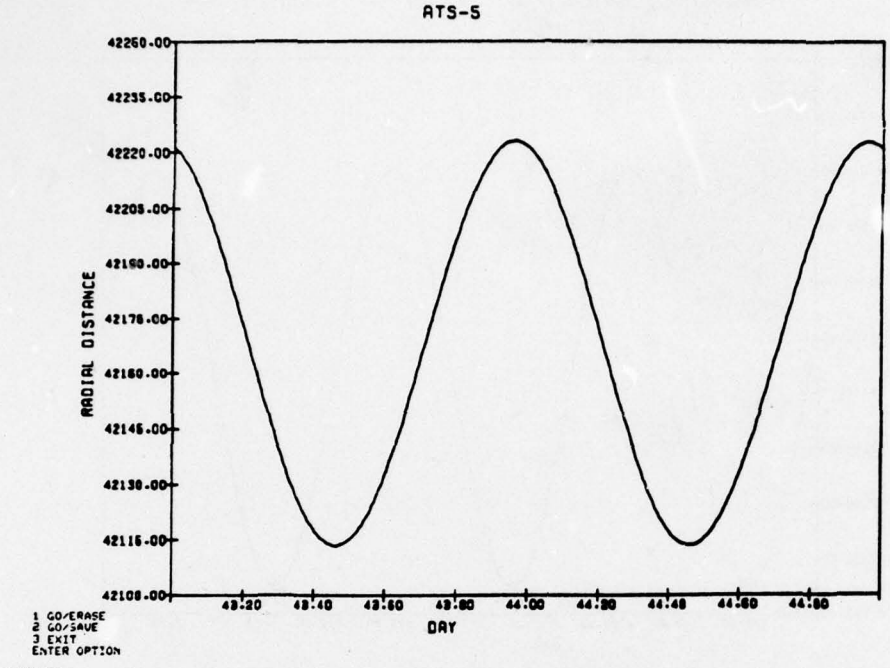
ATS-5 2/ 6/70 2/ 9/70 0HR 0MN



ATS-5 2/ 9/70 2/12/70 0HR 0MN



ATS-5 2/12/70 2/14/70 0HR 0MN



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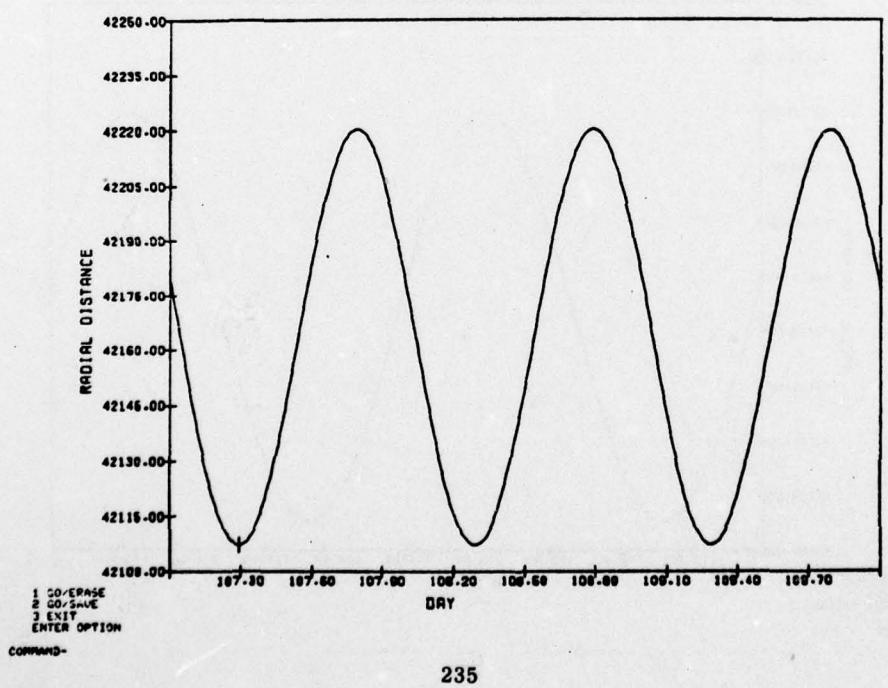

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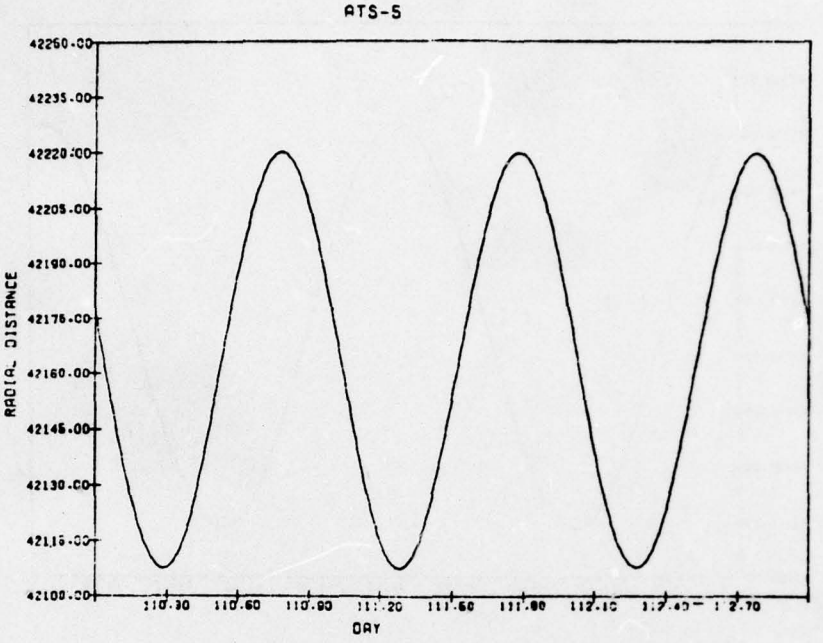

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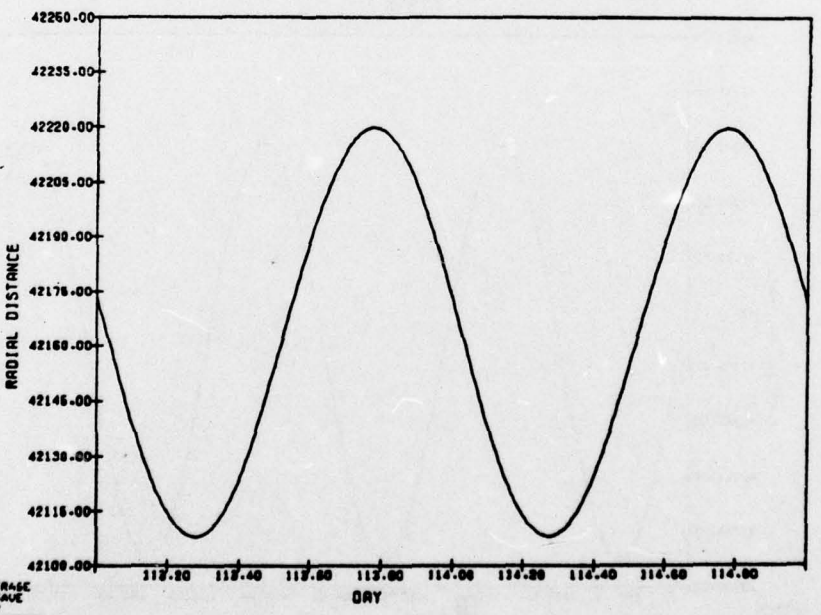

1 GO/ERASE
2 GO/SAVE
3 EXIT
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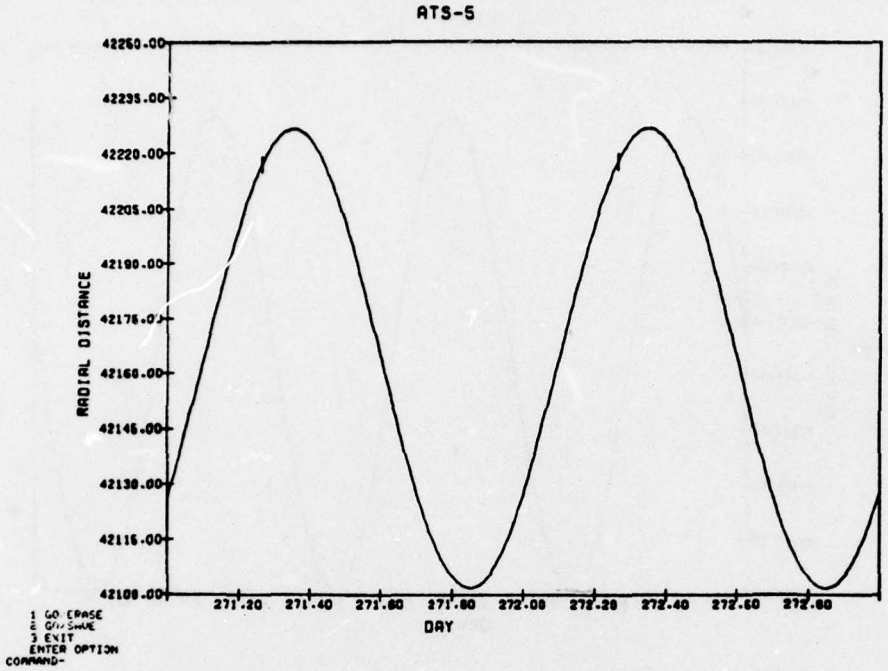

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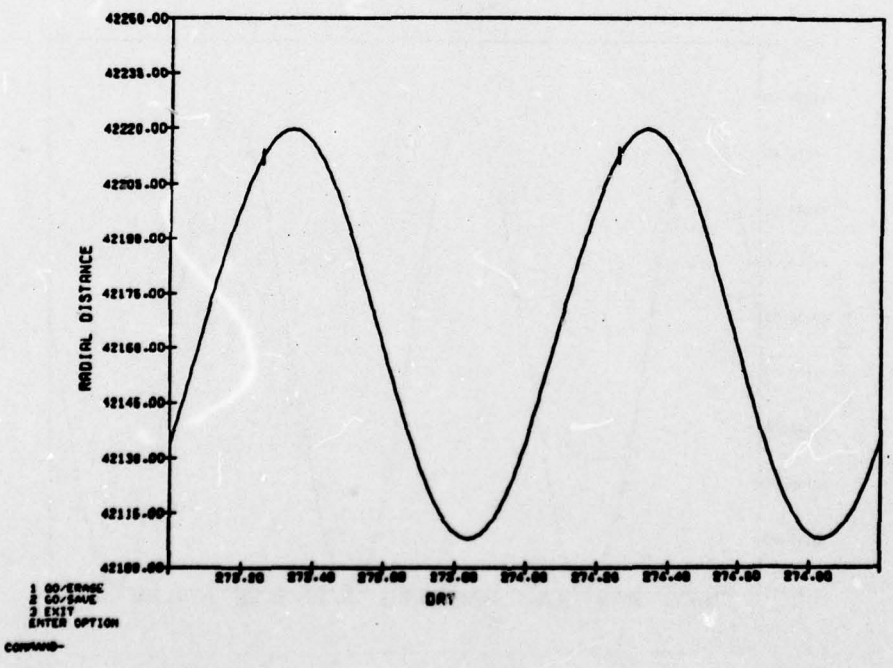

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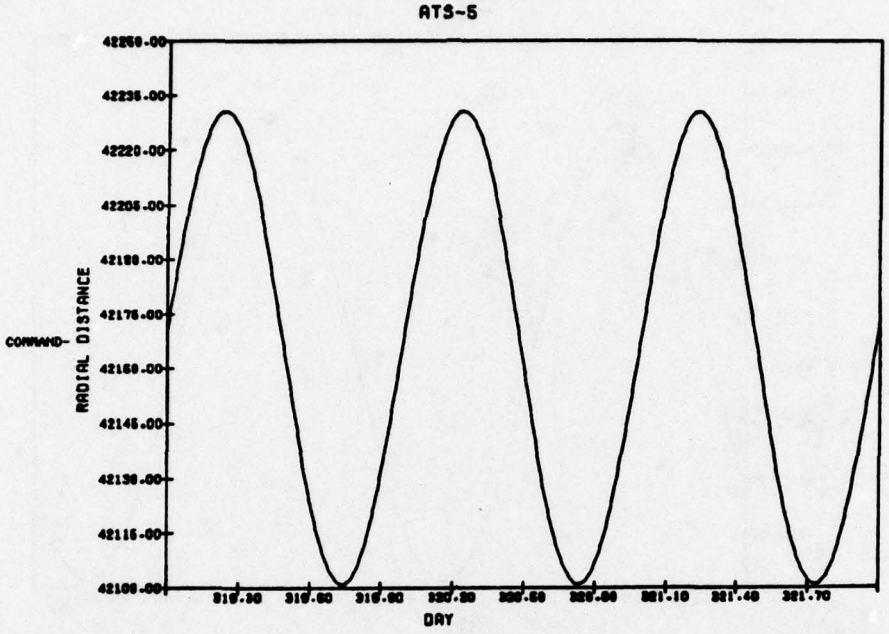

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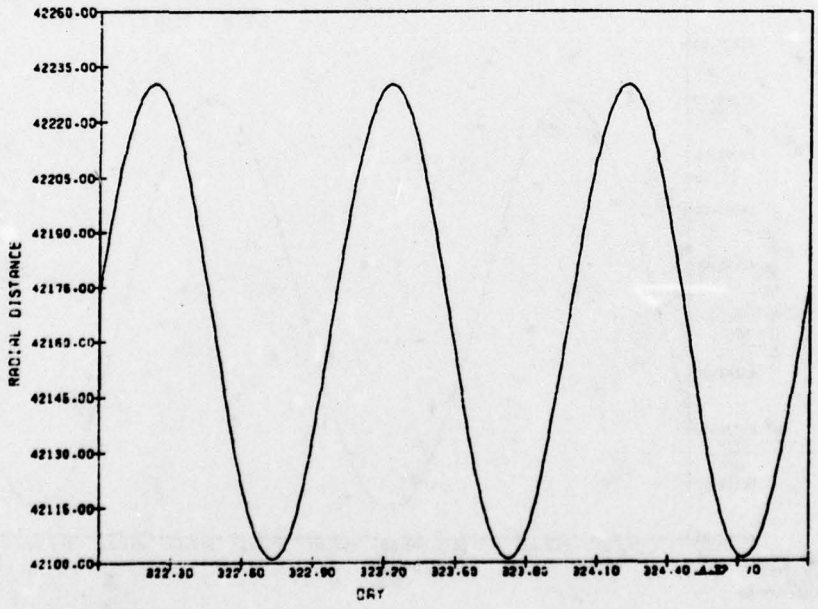

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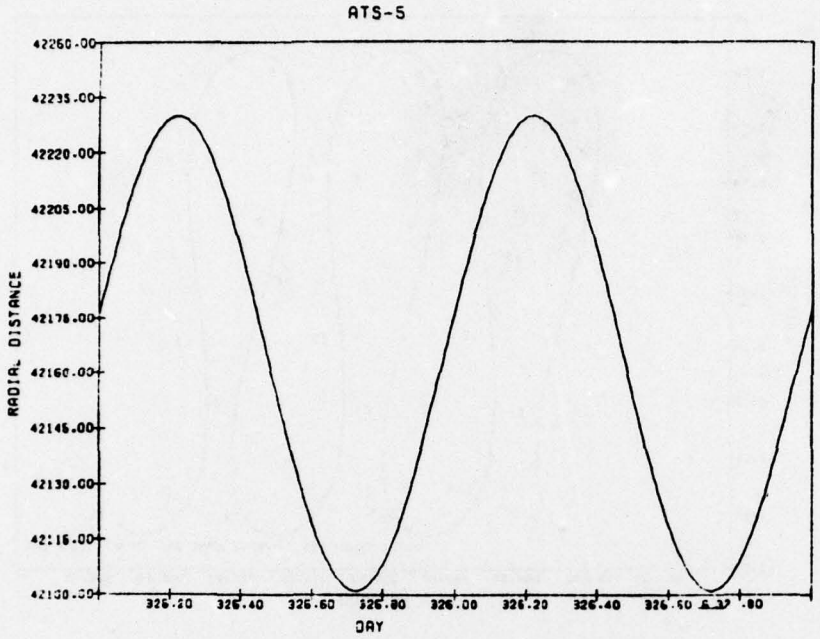

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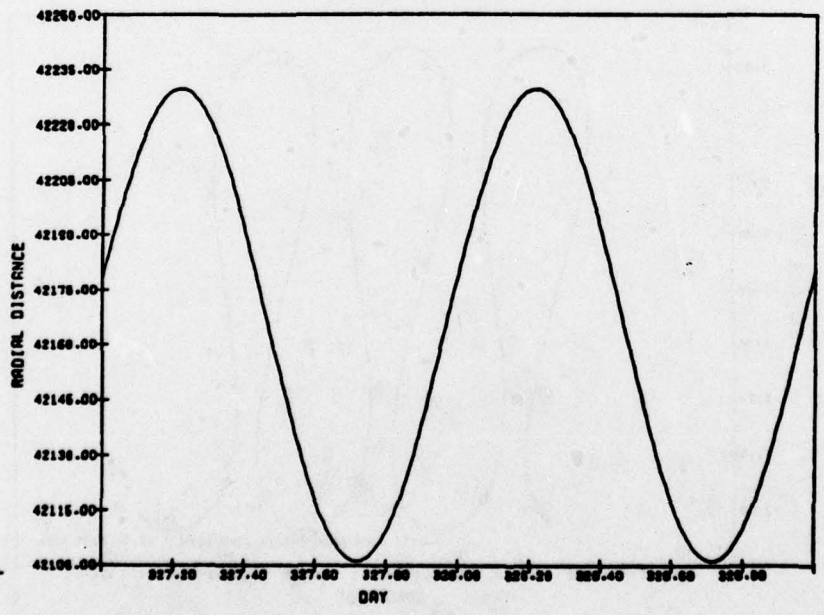

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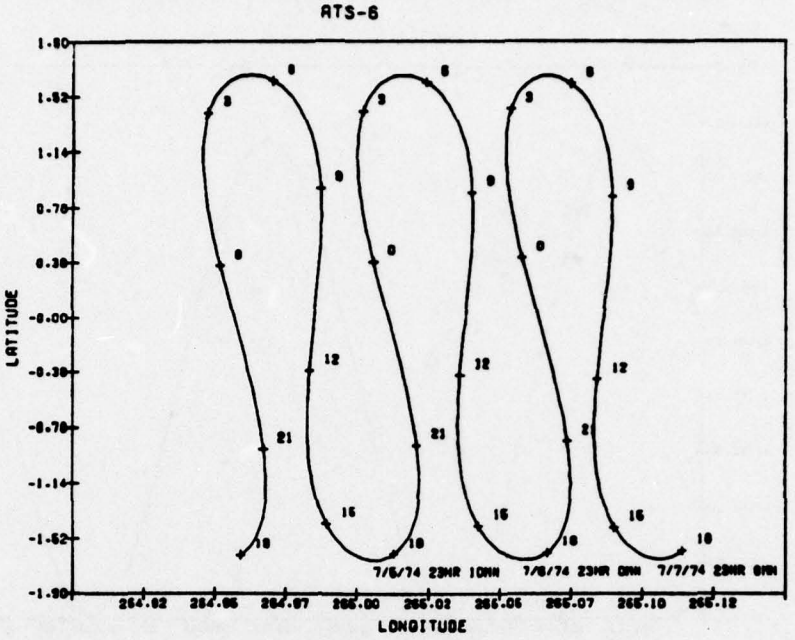

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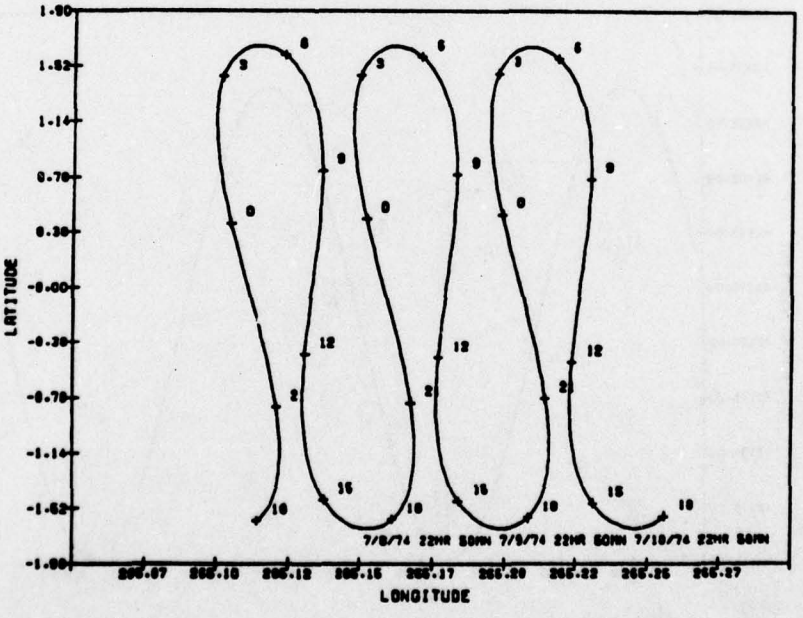

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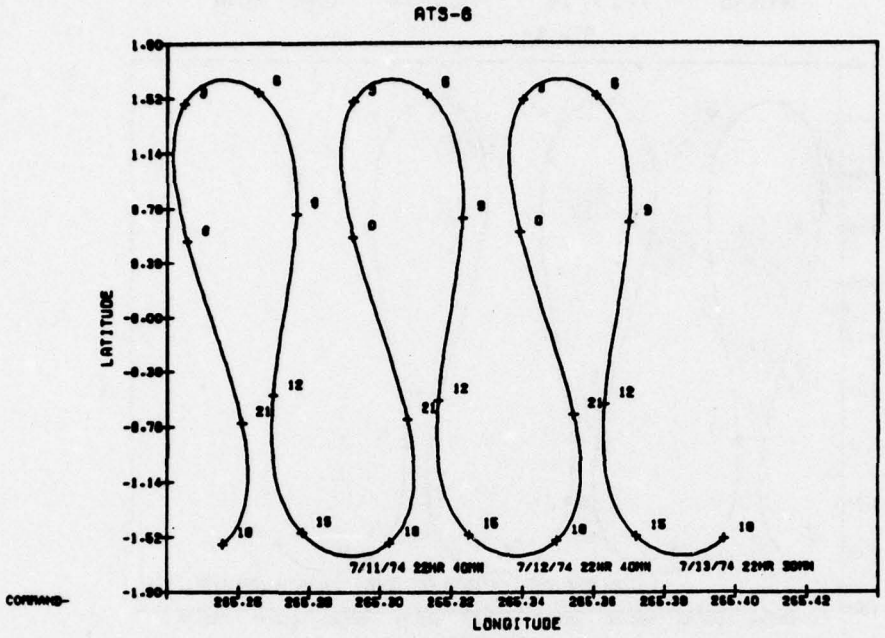

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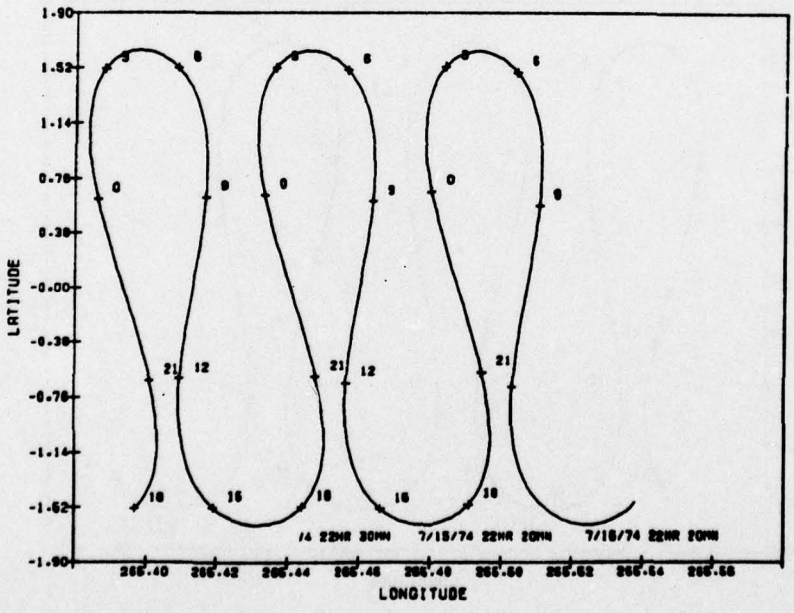

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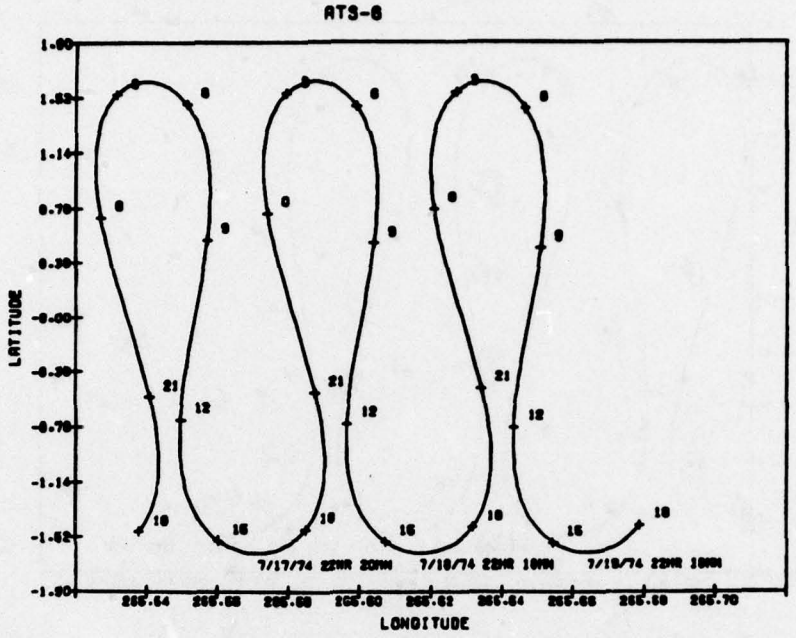

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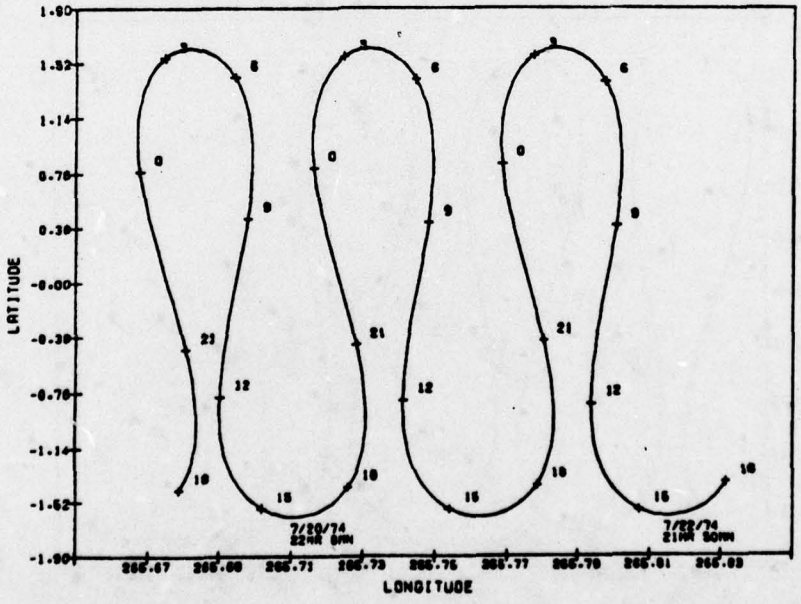

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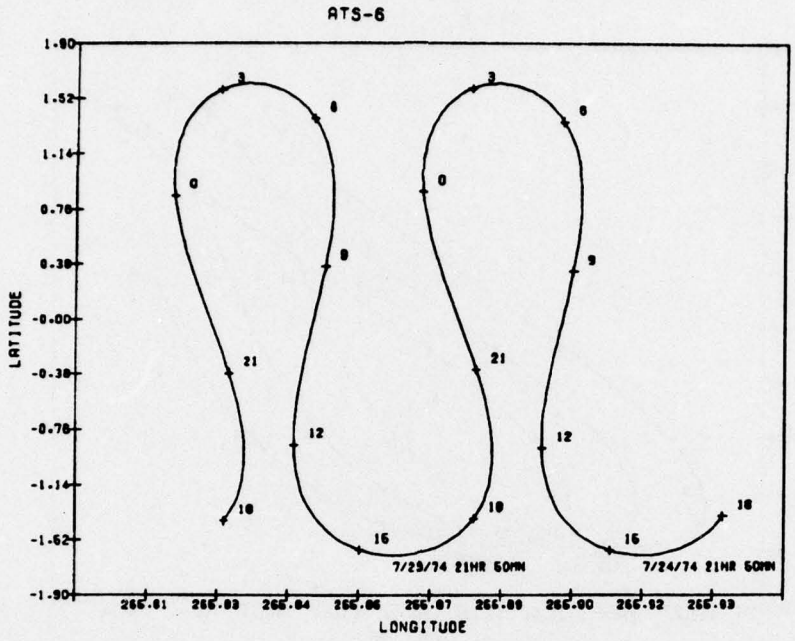

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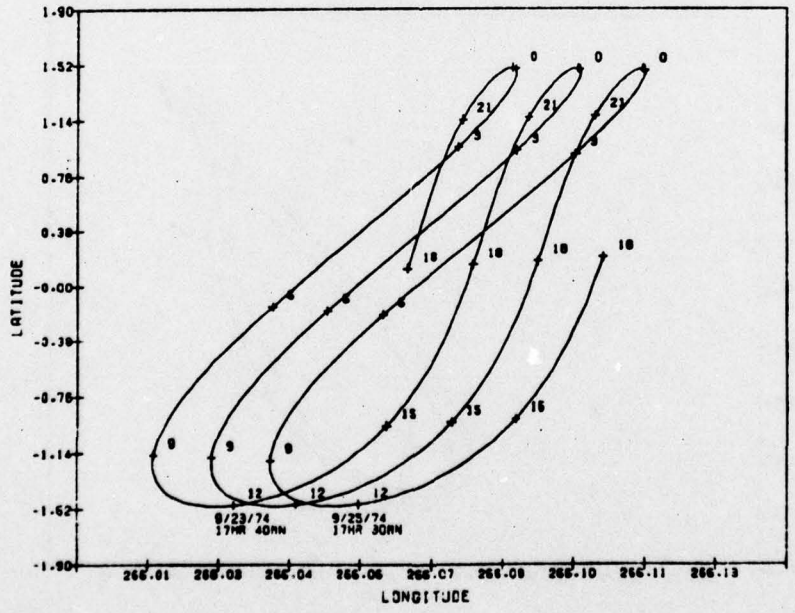

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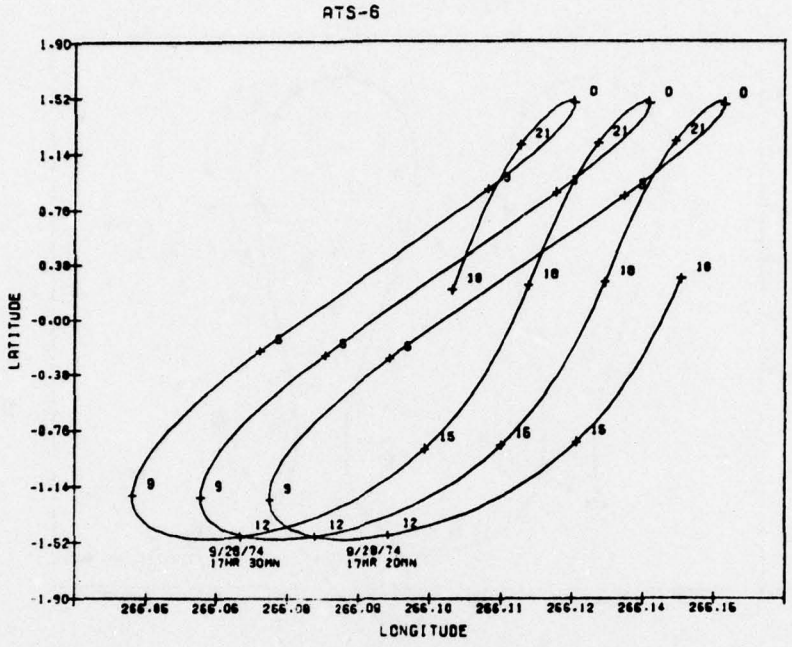

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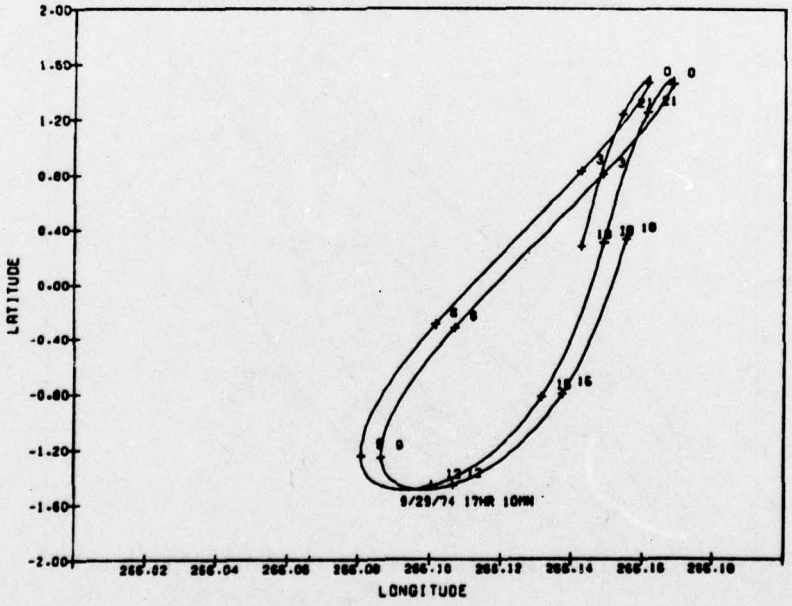

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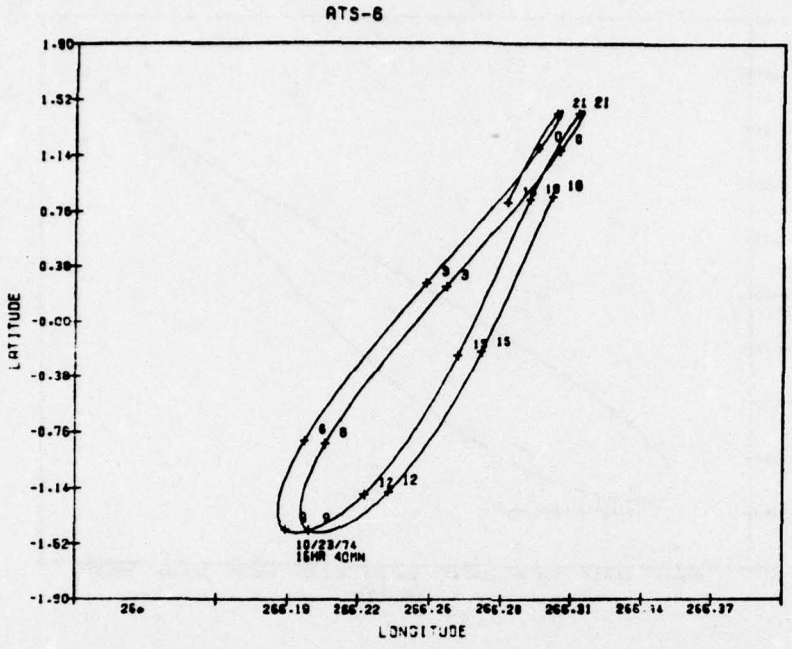

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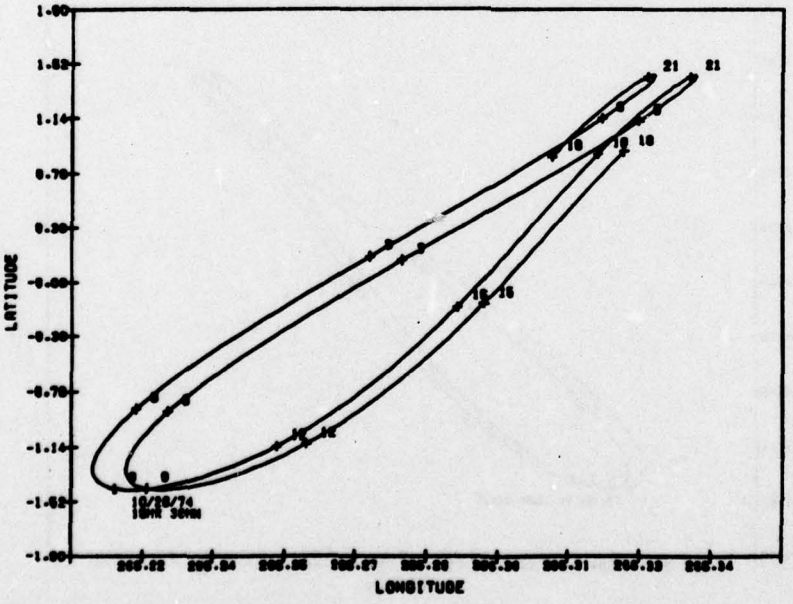

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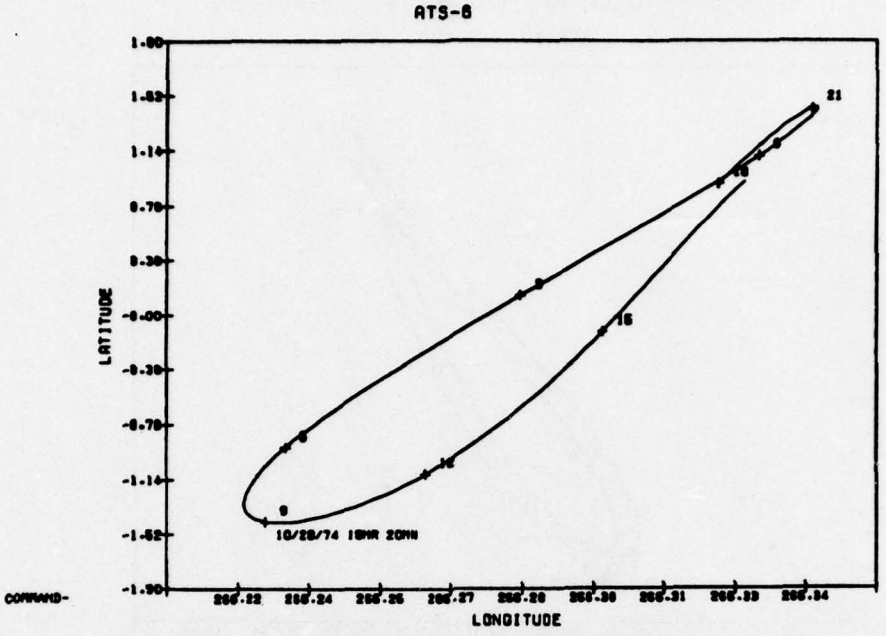

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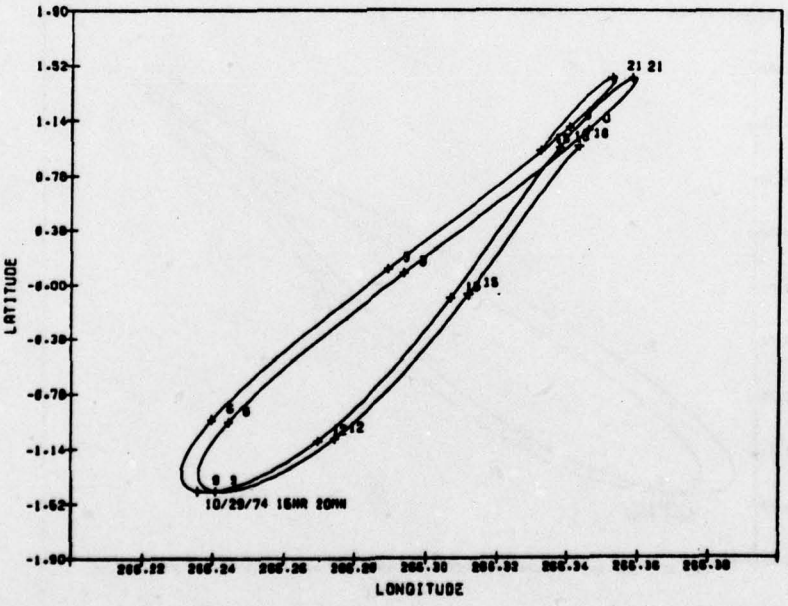

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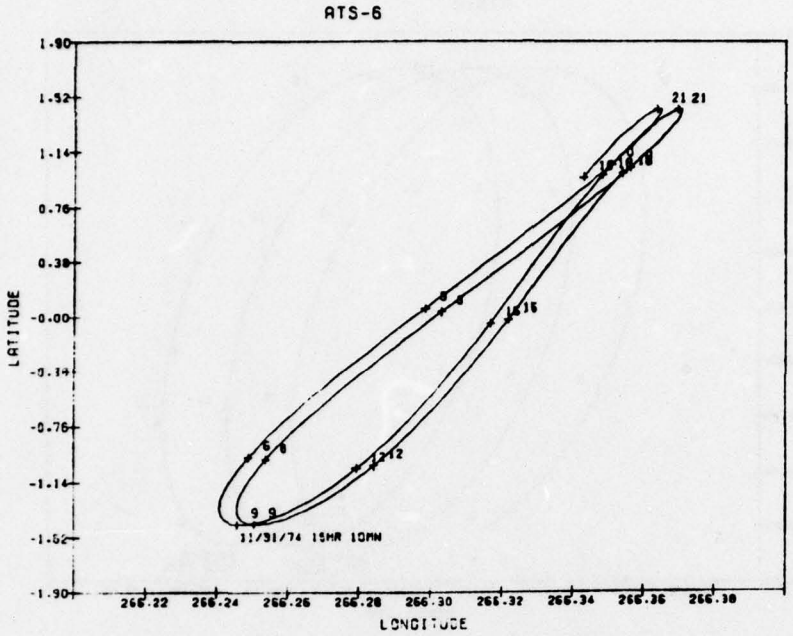

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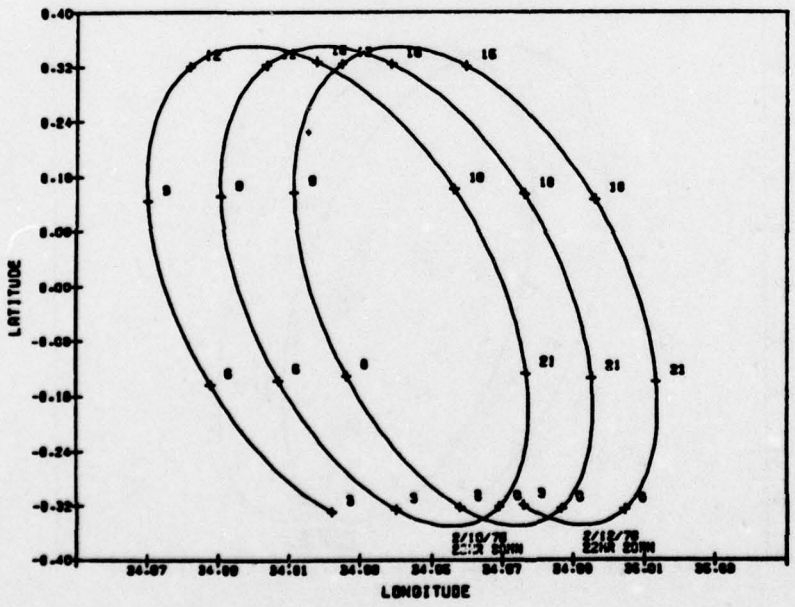

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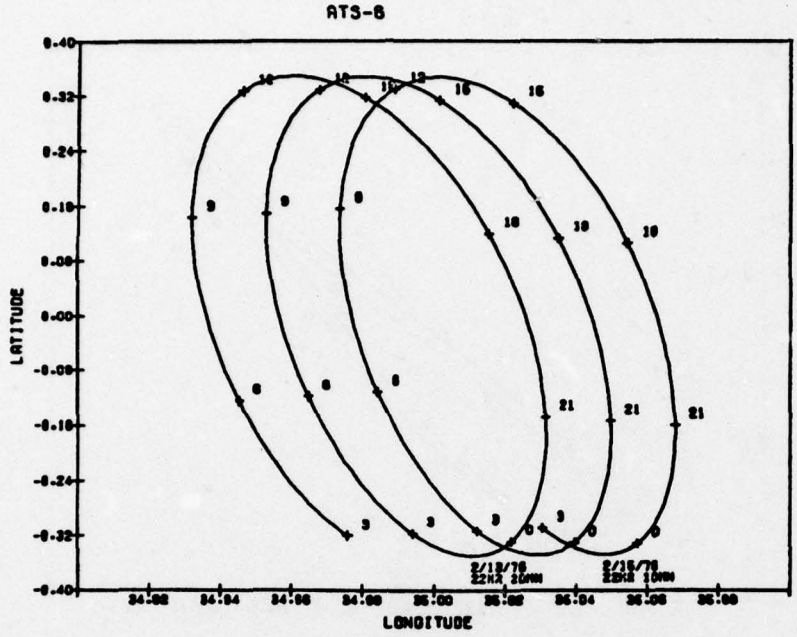

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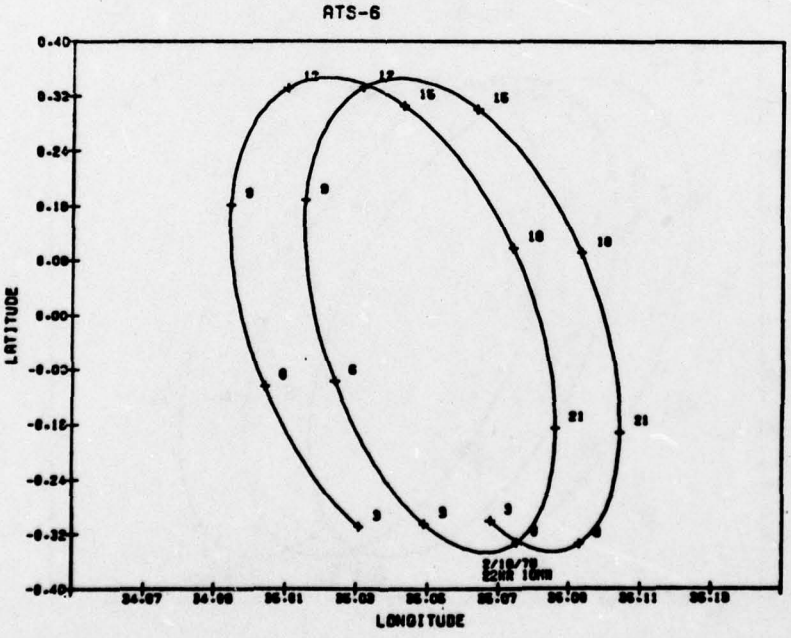
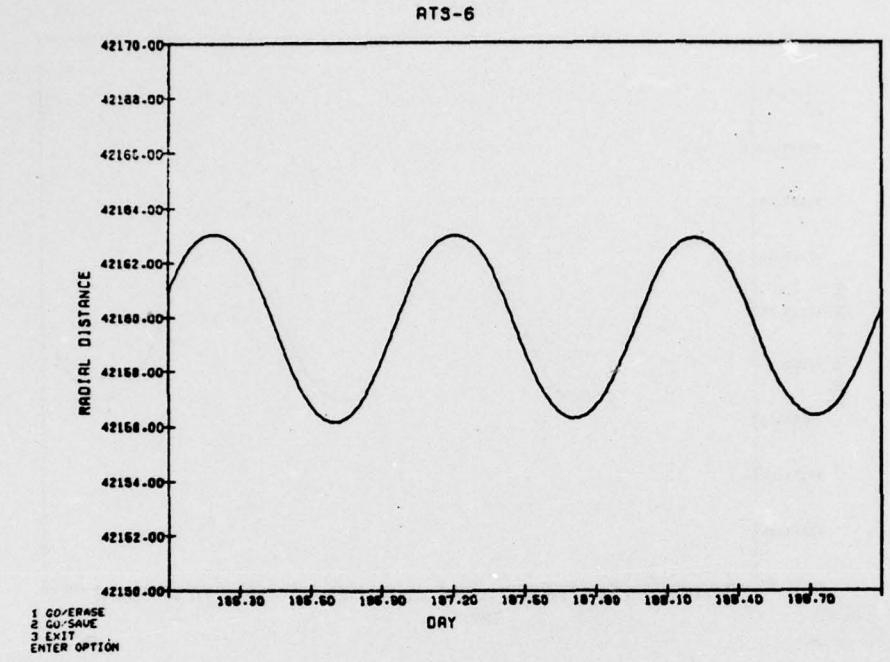


ATS-6 7/ 5/74 7/ 8/74 0HR 0MN



1 GO/ERASE
2 GO/SAVE
3 EXIT
ENTER OPTION

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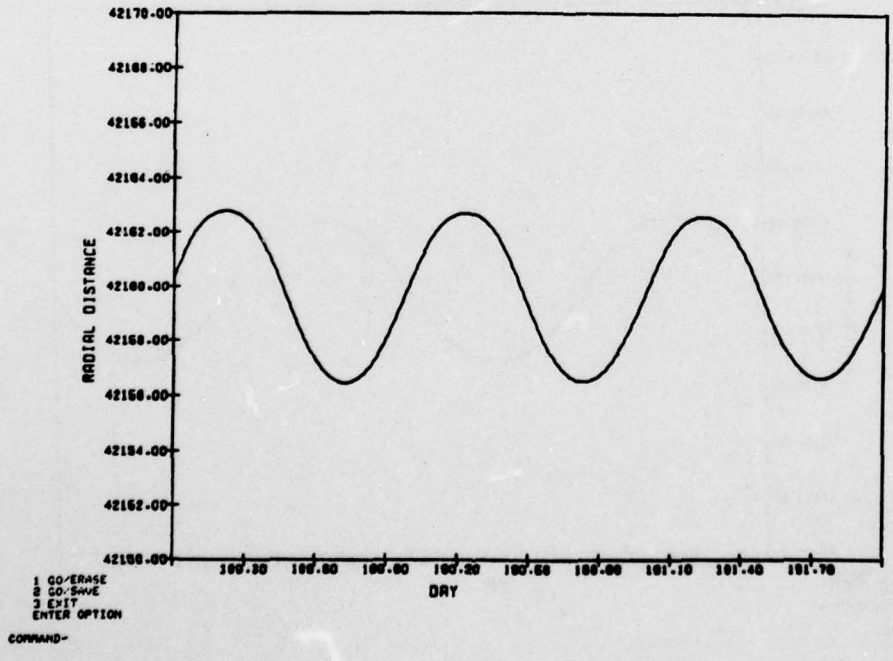

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2 GO/SAVE
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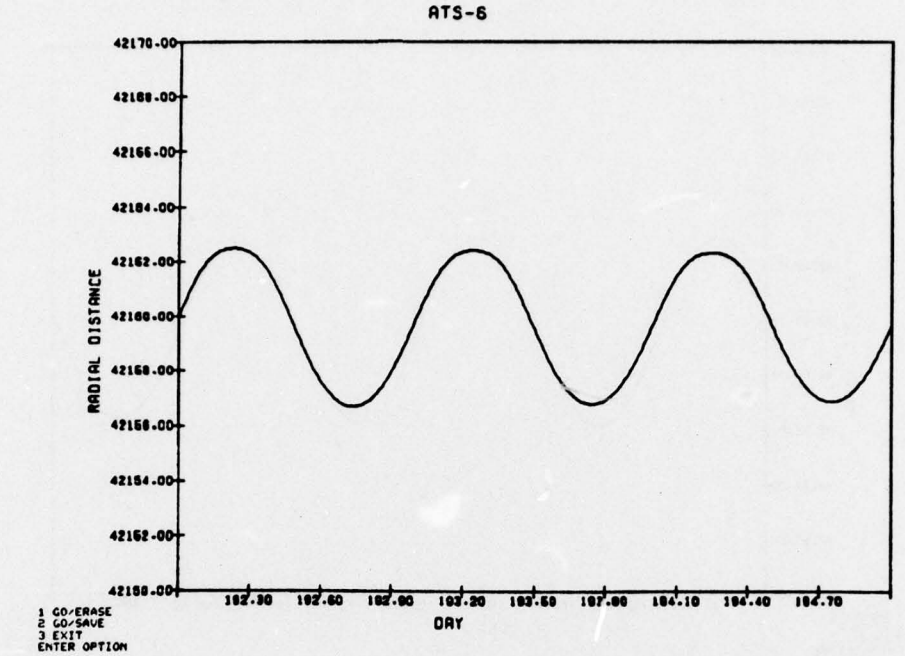
ATS-6 7/11/74 7/14/74 0HR 0MN



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2 GO/SAVE
3 EXIT
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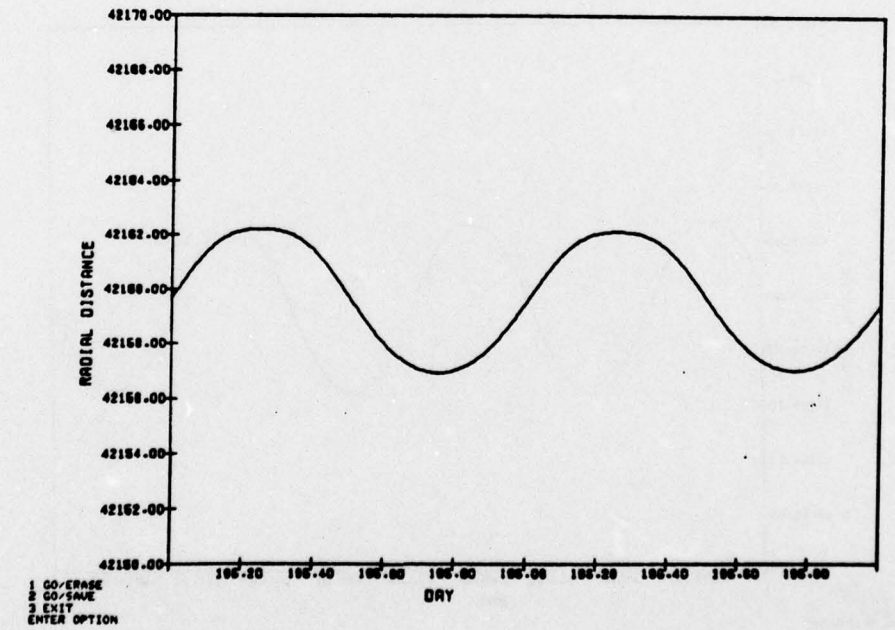

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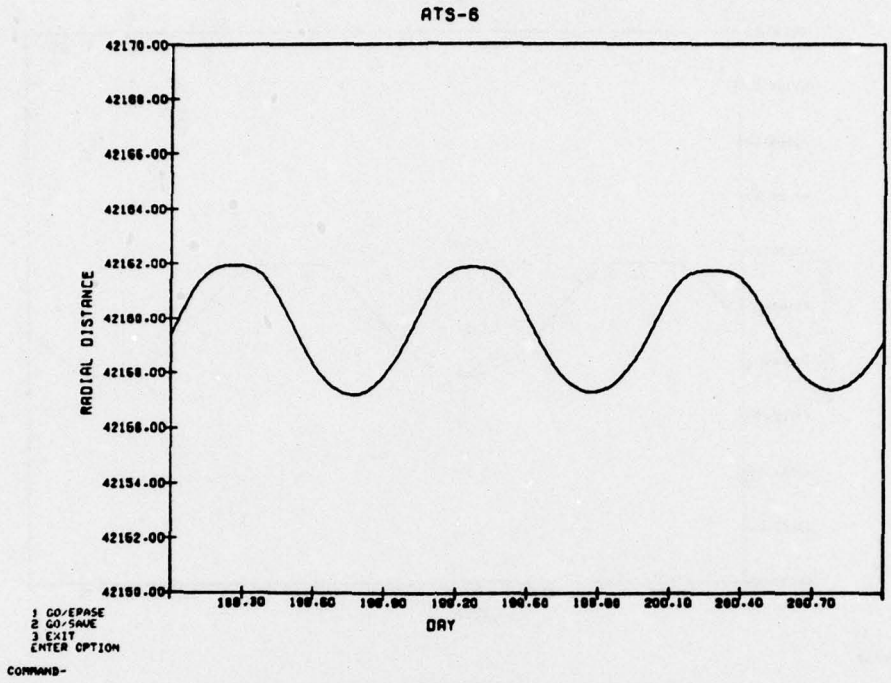

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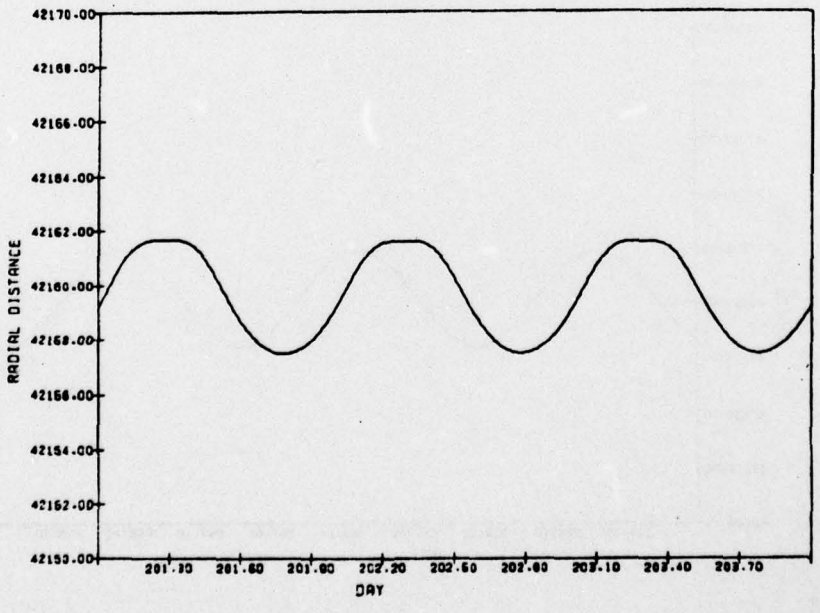

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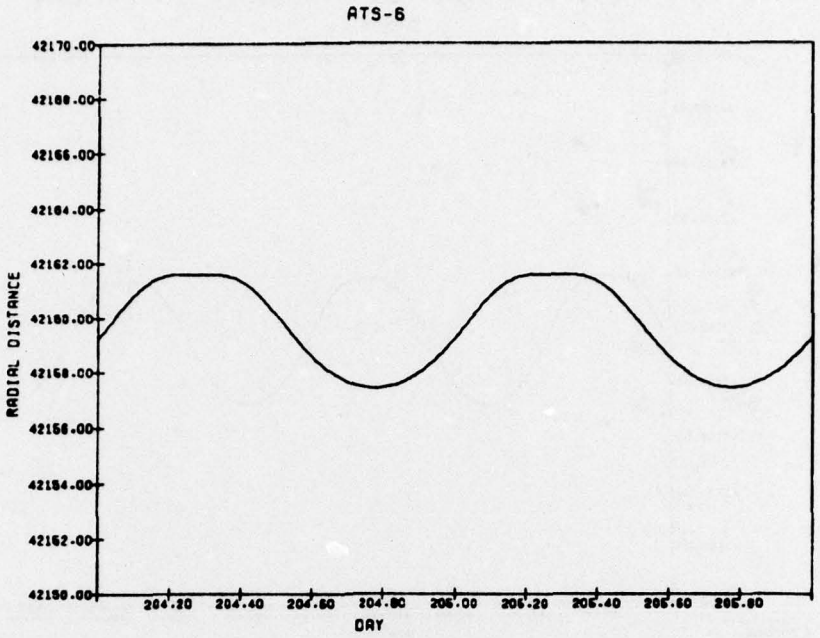

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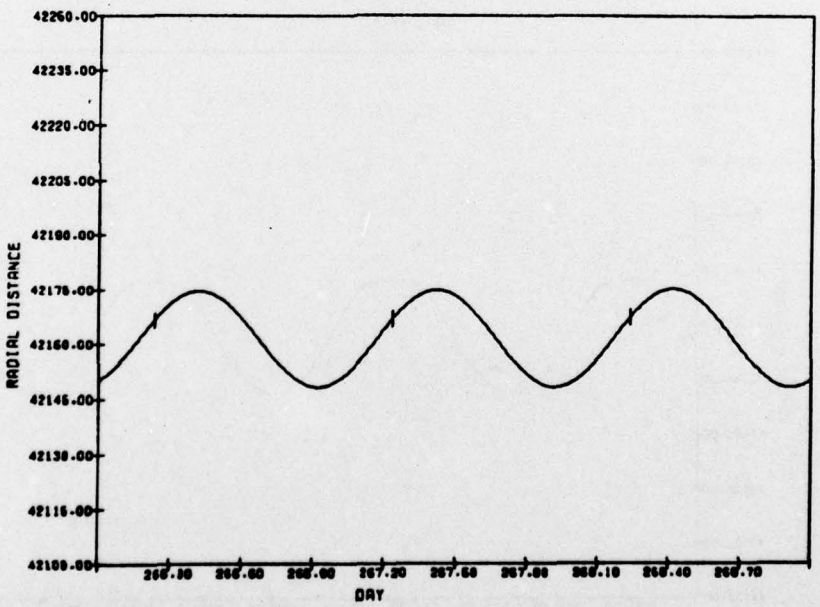

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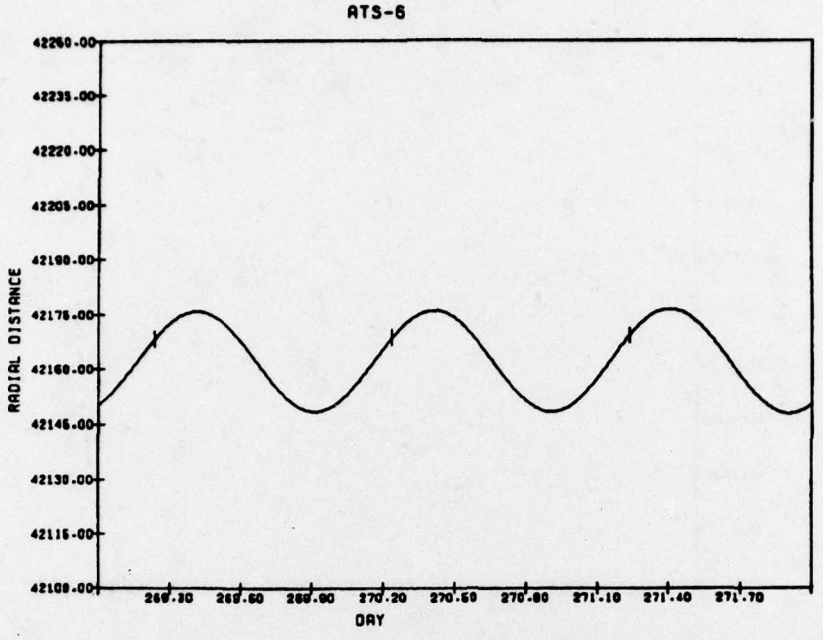

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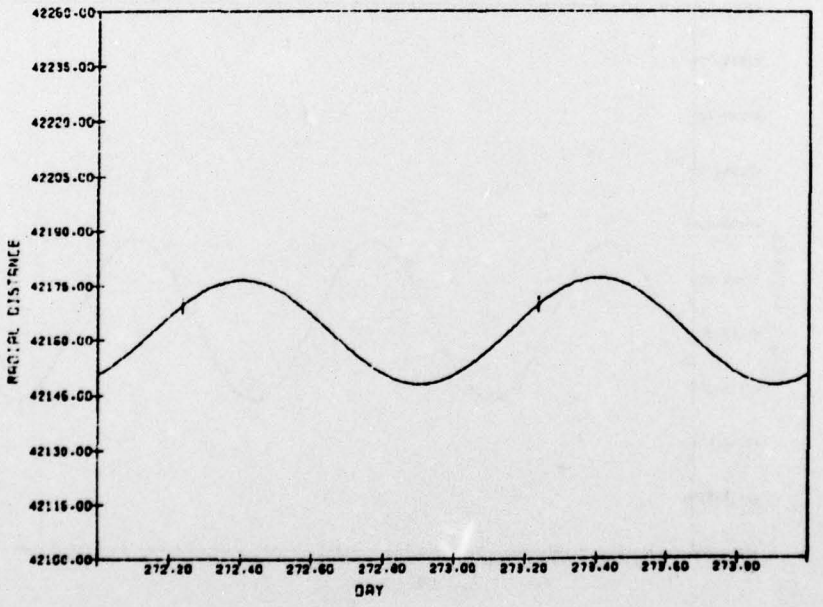

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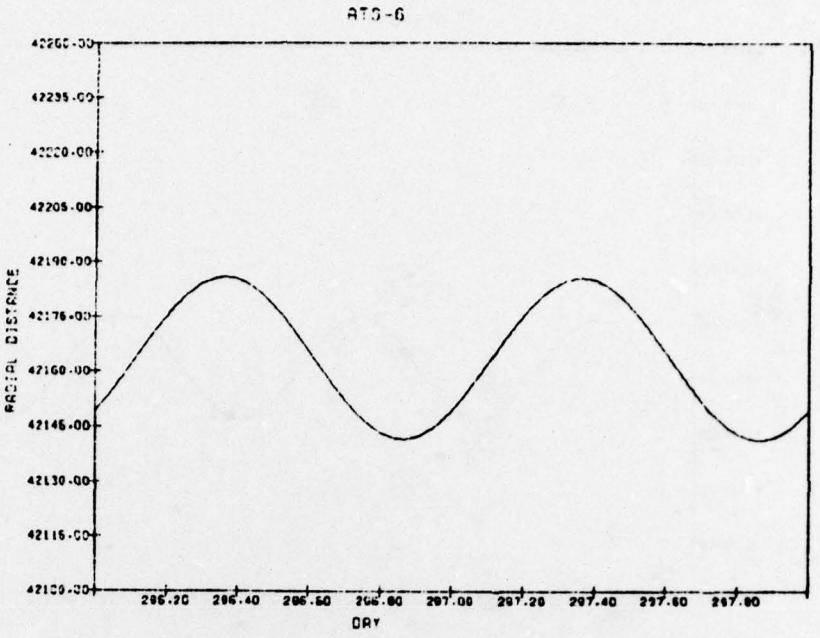

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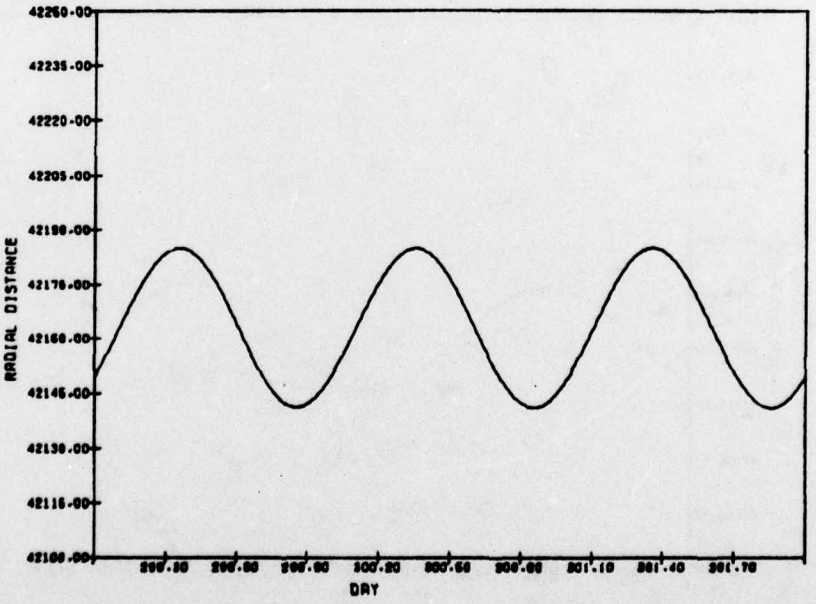

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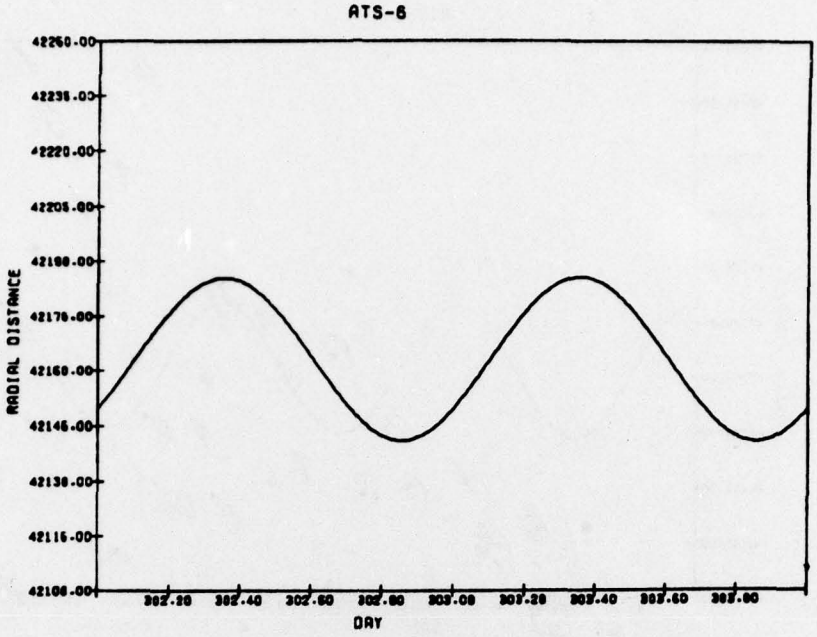

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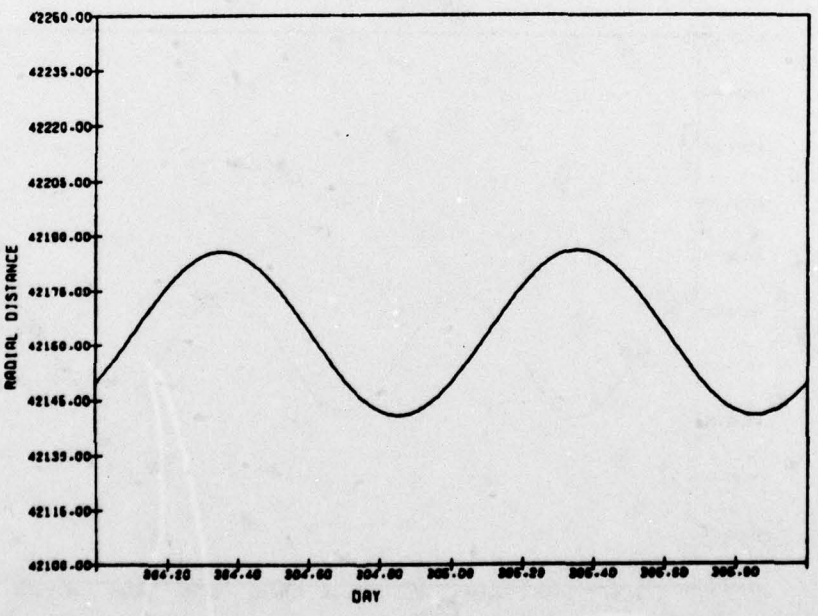

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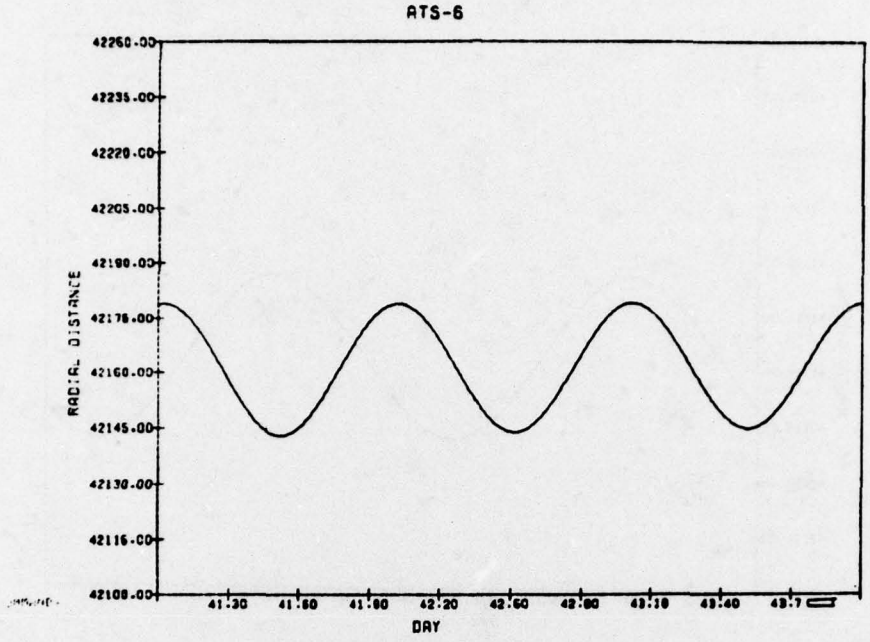

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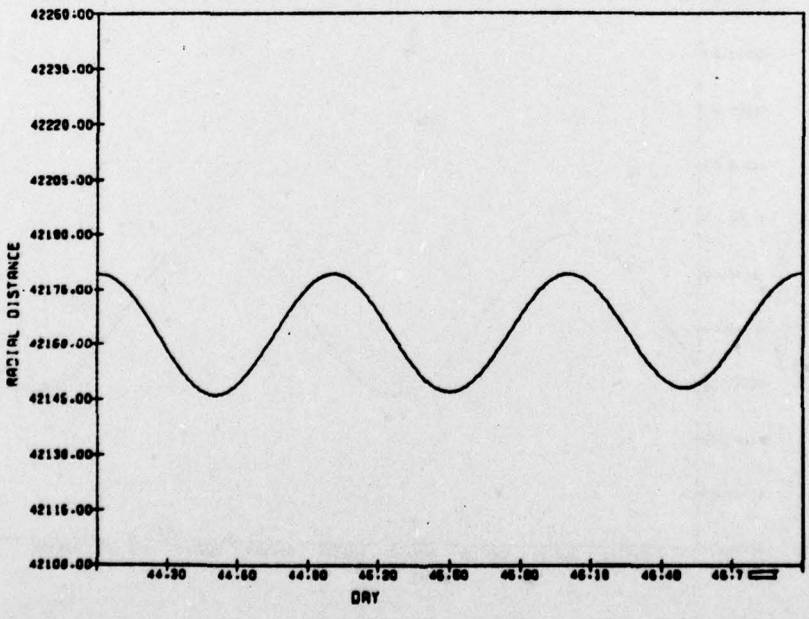

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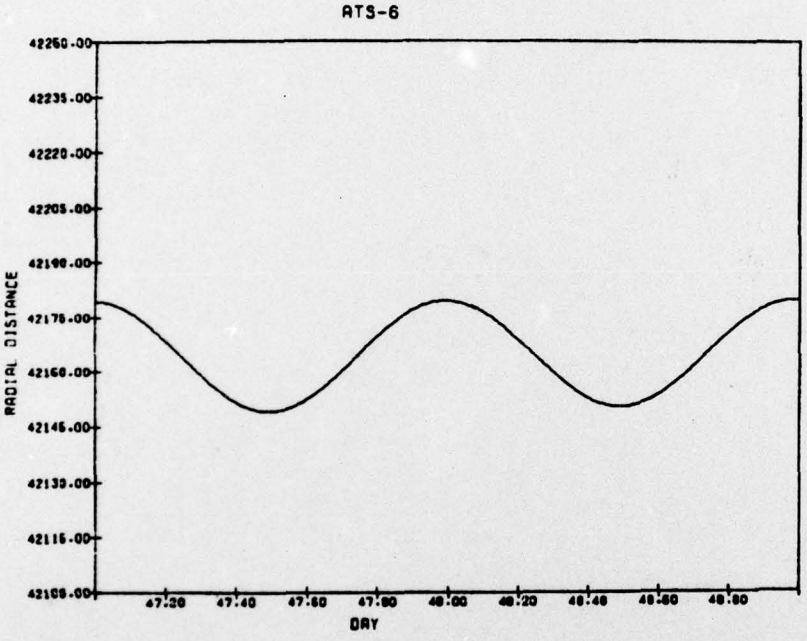
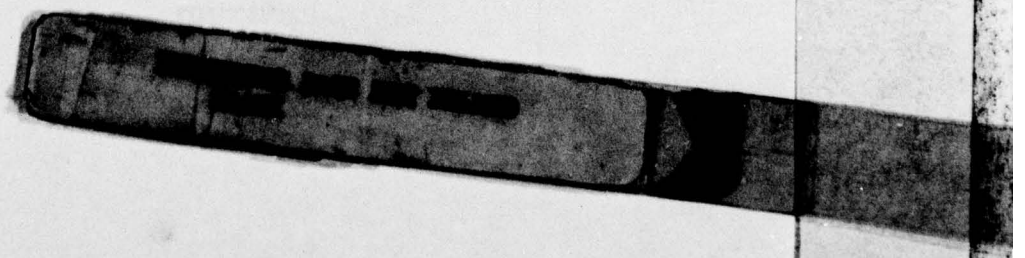
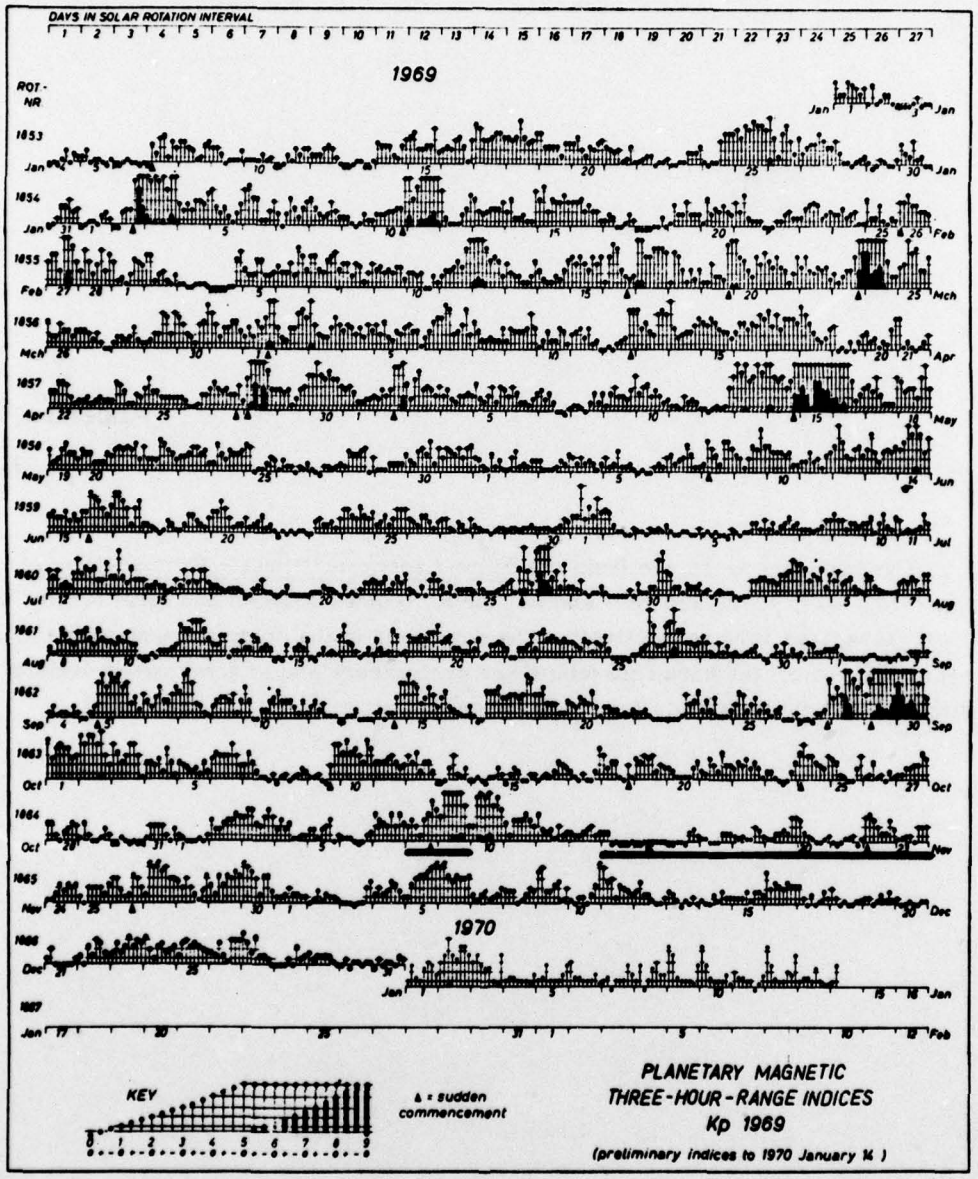


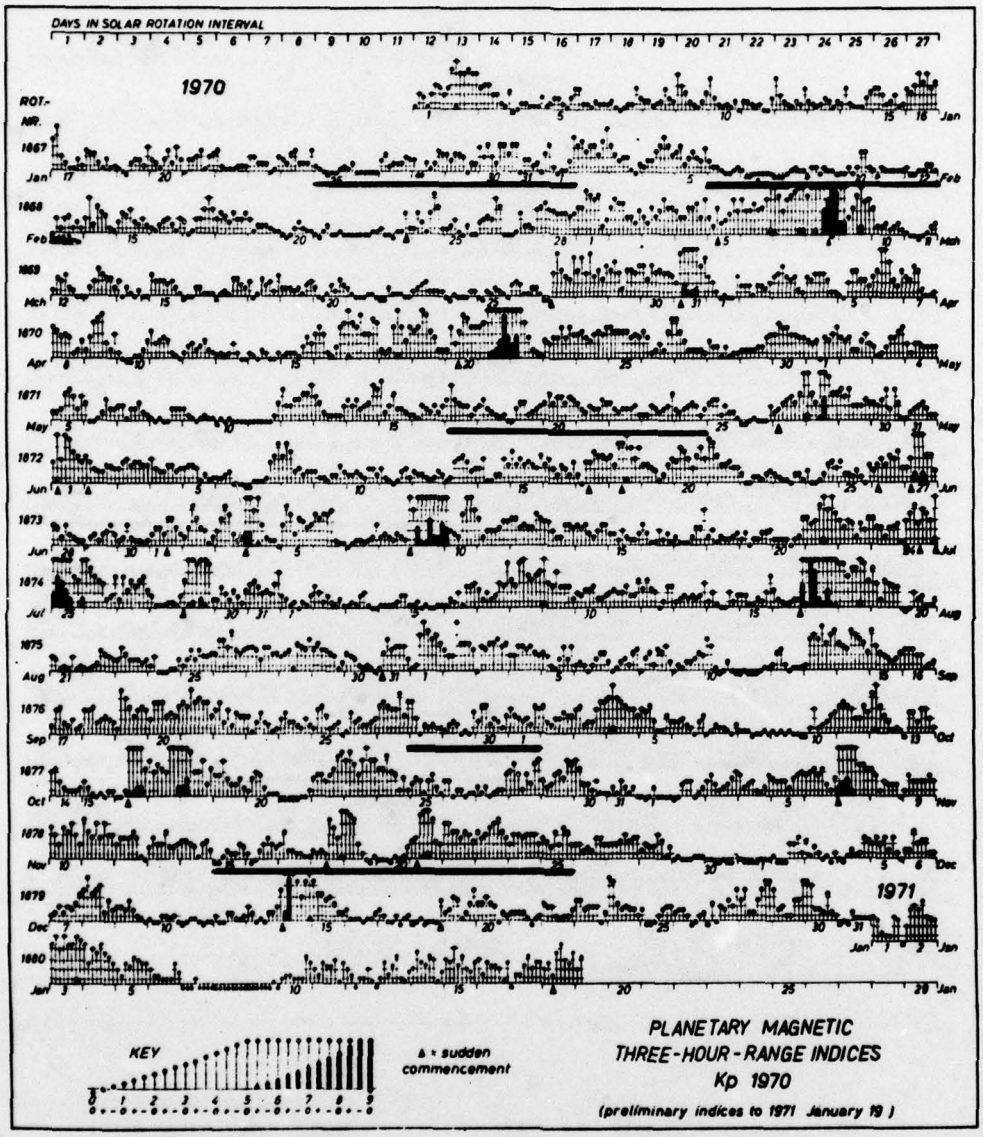
Appendix C

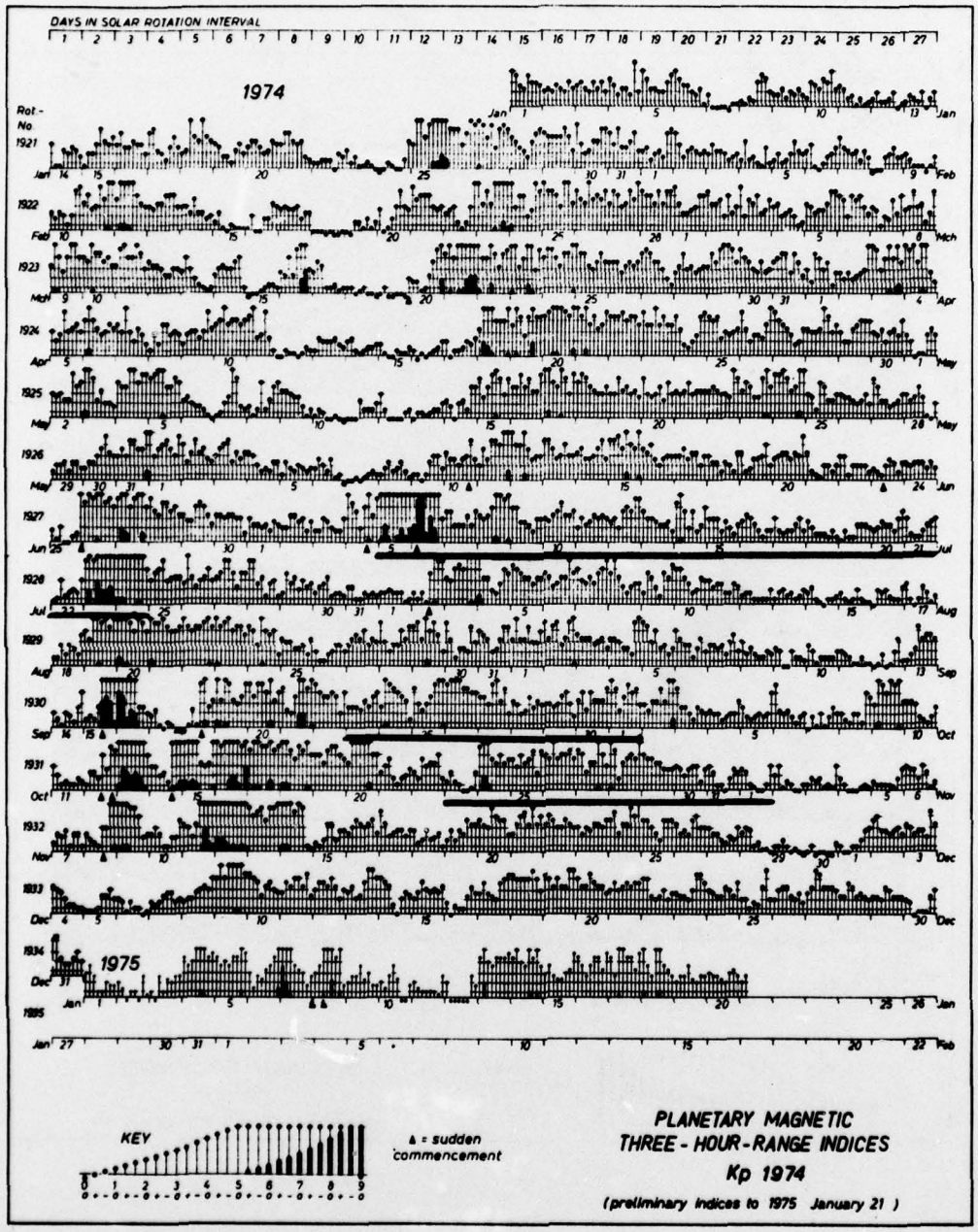
K_p Indices

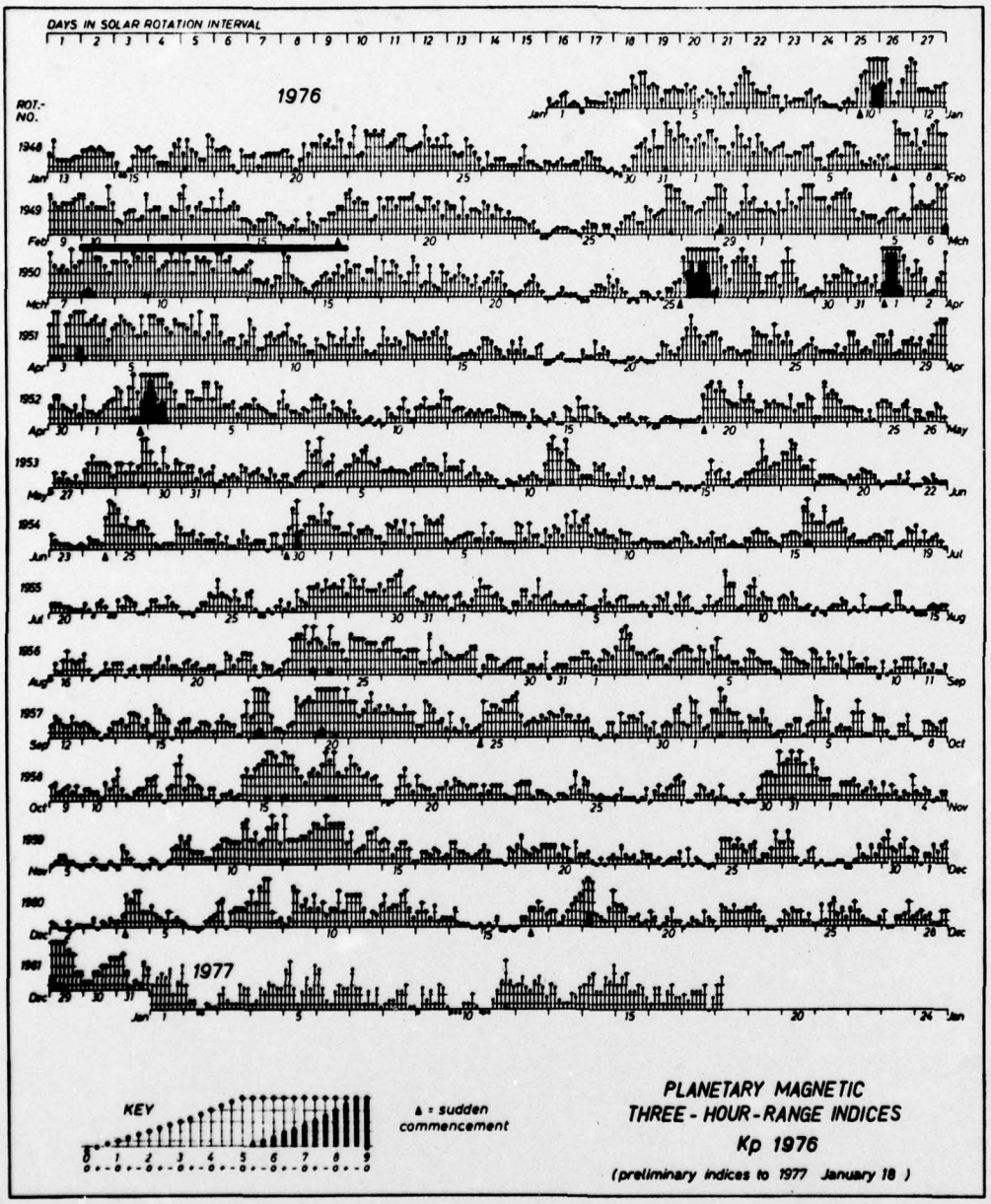
The following pages are from the Solar-Geophysical Data - Prompt Reports for 1970, 1971, 1975, and 1977 and list the K_p indices in harmonic form for 1969, 1970, 1974, and 1976 respectively. The days used in the study are underlined by a heavy line (note: the harmonic tables are preliminary and in some cases deviate slightly from the WDC data for K_p listed on the tapes).




DAYS IN SOLAR ROTATION INTERVAL
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27
1969
ROT-NR
1853
1854
1855
1856
1857
1858
1859
1860
1861
1862
1863
1864
1865
1866
1867
1970
KEY
0 1 2 3 4 5 6 7 8 9
Δ = sudden commencement
PLANETARY MAGNETIC
THREE-HOUR-RANGE INDICES
Kp 1969
(preliminary indices to 1970 January 14)


DAYS IN SOLAR ROTATION INTERVAL
1970
ROT-NR.
1971
KEY
Δ = sudden commencement
PLANETARY MAGNETIC
THREE-HOUR-RANGE INDICES
Kp 1970
(preliminary indices to 1971 January 19)


DAYS IN SOLAR ROTATION INTERVAL
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27
1974
Rot.-
No.
1921
1922
1923
1924
1925
1926
1927
1928
1929
1930
1931
1932
1933
1934
1975
1895
KEY
0 1 2 3 4 5 6 7 8 9
0- 0+ 1- 1+ 2- 2+ 3- 3+ 4- 4+ 5- 5+ 6- 6+ 7- 7+ 8- 8+ 9- 9+
Δ = sudden commencement
PLANETARY MAGNETIC
THREE-HOUR-RANGE INDICES
Kp 1974
(preliminary indices to 1975 January 21)


DAYS IN SOLAR ROTATION INTERVAL
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27
ROT.-NO.
1976
1948
1949
1950
1951
1952
1953
1954
1955
1956
1957
1958
1959
1960
1961
1977
KEY
0 1 2 3 4 5 6 7 8 9
▲ = sudden commencement
PLANETARY MAGNETIC
THREE-HOUR-RANGE INDICES
Kp 1976
(preliminary indices to 1977 January 18)

Appendix D

ATS Data Tape Formats

Two tapes containing 10-min averages of the four moments of the distribution function for ATS-5 and ATS-6 are available in the format described in Table D1. For ATS-5, the detector numbers correspond to

Detector 1 = perpendicular electrons,
Detector 2 = perpendicular ions,
Detector 3 = parallel electrons,
Detector 4 = parallel ions.

For ATS-6, the detector numbers are

Detector 1 = North-South electrons,
Detector 2 = North-South ions.

The tapes are available from AFGL/SUA (R. McInerney) or (preferably) the National Space Science Data Center, NASA Goddard, Greenbelt, MD 20771 (Attn: J. Vette).

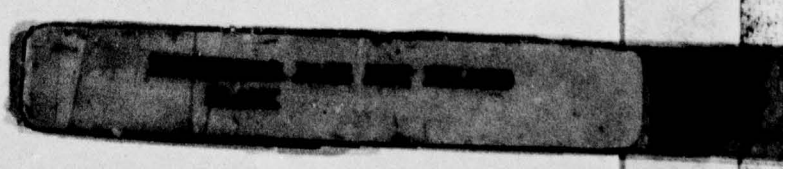


Table D1. ATS Data Tape Formats

Data is stored in CDC 60-bit format.
Standard data set contains data collected during a 10-min interval.
Standard records contain 1 hr of data, that is, six sets.
Total record size is 512 words.
Standard file contains data for one day.
These are labeled, 800 B.P.I., NOS/BE standard, 7-track tapes
Record structure, based on CDC words contains two identification words before the data sets.
Type of word: C, coded; F, floating; I, integer.

WORD	TYPE	DESCRIPTION
1	I	number of words in data set (usually 85)
2	I	presently unused, set to 0

There are six data sets for 1 hr of data or 510 words, based on CDC words.

WORD	TYPE	DESCRIPTION	DETECTOR	ORIGIN OF DATA
1	C	"ATS 5" or "ATS 6"		ATS-5 & ATS-6
2	F	YEAR		" "
3	F	MONTH		" "
4	F	DAY		" "
5	F	HOUR		" "
6	F	AVERAGE MINUTE		" "
7	F	DAY OF YEAR		" "
8	F	NUMBER DENSITY (N/cm^3)	1	" "
9	F	NUMBER OF VALUES		" "
10	F	NUMBER FLUX ($N/cm^2/sec/sr$)	1	" "
11	F	NUMBER OF VALUES		" "
12	F	ENERGY DENSITY (eV/cm^3)	1	" "
13	F	NUMBER OF VALUES		" "
14	F	ENERGY FLUX ($eV/cm^2/sec/sr$)	1	" "
15	F	NUMBER OF VALUES		" "
16	F	NUMBER DENSITY (N/cm^3)	2	" "
17	F	NUMBER OF VALUES		" "
18	F	NUMBER FLUX ($N/cm^2/sec/sr$)	2	" "
19	F	NUMBER OF VALUES		" "
20	F	ENERGY DENSITY (eV/cm^3)	2	" "
21	F	NUMBER OF VALUES		" "
22	F	ENERGY FLUX ($eV/cm^2/sec/sr$)	2	" "
23	F	NUMBER OF VALUES		" "
24	F	NUMBER DENSITY (N/cm^3)	3	ATS 5
25	F	NUMBER OF VALUES		"
26	F	NUMBER FLUX ($N/cm^2/sec/sr$)	3	"
27	F	NUMBER OF VALUES		"
28	F	ENERGY DENSITY (eV/cm^3)	3	"
29	F	NUMBER OF VALUES		"
30	F	ENERGY FLUX ($eV/cm^2/sec/sr$)	3	"
31	F	NUMBER OF VALUES		"
32	F	NUMBER DENSITY (N/cm^3)	4	"
33	F	NUMBER OF VALUES		"
34	F	NUMBER FLUX ($N/cm^2/sec/sr$)	4	"
35	F	NUMBER OF VALUES		"
36	F	ENERGY DENSITY (eV/cm^3)	4	"
37	F	NUMBER OF VALUES		"
38	F	ENERGY FLUX ($eV/cm^2/sec/sr$)	4	"
39	F	NUMBER OF VALUES		"

Table D1. ATS Data Tape Format (Cont)

WORD	TYPE	DESCRIPTION	ORIGIN OF DATA
40	F	TEMPERATURE CORRECTION COEFF.	ATS 6
41	F	ANGLE N-S DETECTOR	"
42	F	PITCH ANGLE	"
43	F	ENERGY STEP OF PHOTOELECTRON CUTOFF	"
44	F	ELECTRON CUTOFF ENERGY	"
45	F	SPACECRAFT POTENTIAL	"
46	F	COLATITUDE (Degrees)	ATS 5
47	F	LONGITUDE (Degrees)	"
48	F	RADIUS (Re)	"
49	F	$\perp$ MAGNETIC FIELD COMPONENT ($B\perp$ in γ)	"
50	F	MAGNETIC FIELD IN Z DIRECTION (B_z in γ)	"
51	F	TOTAL MAGNETIC FIELD (B in γ)	"
52	F	INCLINATION OF SATELLITE TO B	"
53	F	AE AVERAGE	AE Tape
54	F	AE MAXIMUM	"
55	F	KP VALUES	Data Cards
56	F	RADIUS (Km)	Ephemeris Tape
57	F	LATITUDE (Deg.)	Ephemeris Tape
58	F	LONGITUDE (Deg.)	Ephemeris Tape
59-85	F	FILL	

The initial fill value, deleted data, and erroneous data are indicated by -999999.

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